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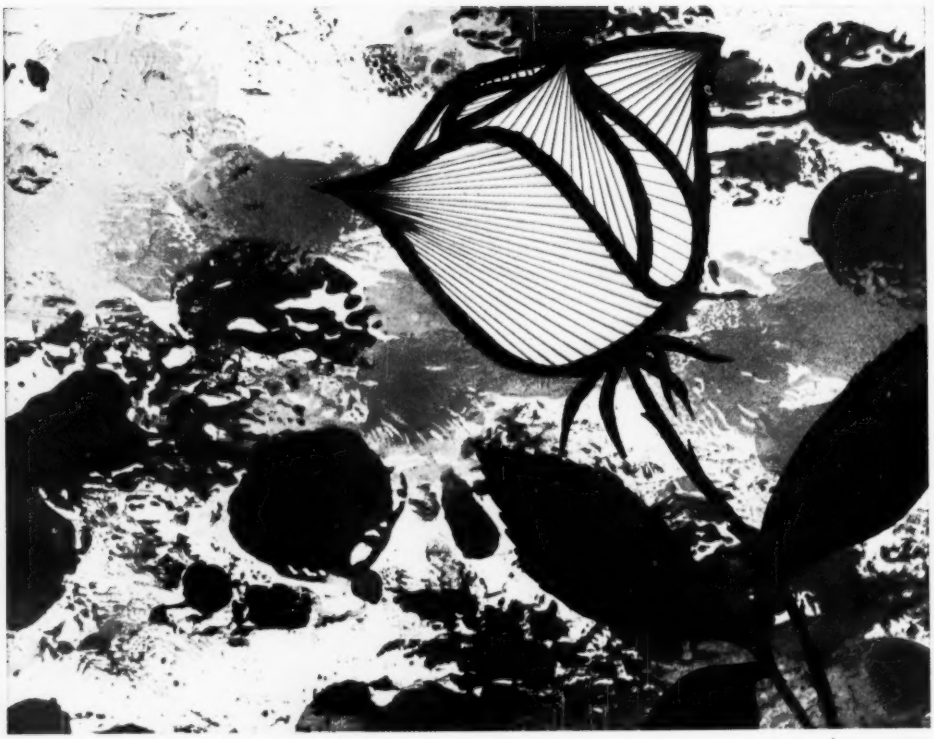

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AMERICAN

DYESTUFF REPORTER

Volume 49 June 27, 1960 No. 13

EFFECTS OF FABRIC STRUCTURE ON THE "WASH-AND-WEAR" PROPERTIES OF VISCOSE LINING FABRICS

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A study has been made of a number of functional properties of a series of filament rayon fabrics intended for use as linings for "wash-and-wear" garments. The variations in construction encompassed a broad range of textures, as well as plain weave and 2/1 and 3/1 twills. All of the fabrics but one were made from 150/40 filament rayon; they were studied in the untreated state, as well as with two levels of "wash-and-wear" treatment.

The resin treatments produced important improvements in the crease recovery, "wash-and-wear" index, and dimensional stability of the rayon fabrics. Even a high level of resin treatment (10.5% nominal add-on) did not produce a serious loss in tensile or tearing strength of the rayon. A level of performance considered adequate for "automatic wash-and-wear" garments was attained within the normal range of lining construction.

The number of yarn crossings per square inch, which includes both the texture and the number of yarns in the weave float, was found to be a useful index of fabric openness. It was found that as the fabrics were made more open, they exhibited improved crease recovery, "wash-and-wear" properties and tearing strength. Thus, these results suggest that a better utilization of filament rayon for use in a lining could be expected from the more open structures, or from a 3/1 twill as compared with the conventional 2/1 fabrics. However, a decision as to the optimum construction for use as a lining fabric must be based on other practical considerations as well, since the most open fabrics exhibited an undesirable degree of yarn shifting, which could affect their handling, fraying and sewing properties.

INTRODUCTION

THE effect of fabric structure on the "wash-and-wear" properties of resin-treated fabrics or fabrics which depend on their content of synthetic fiber for "wash-and-wear" qualities is a subject of considerable current interest. While the chemical and textile literatures are rich in papers describing the effects of resin treatments on "wash-and-wear" properties, there is a surprising paucity of publications on the effects of fabric structure. Reid and co-workers (*5*) have described some of the effects for cotton fabrics in qualitative terms, and Barach (*1*) has commented on the effects of structure on synthetic fabrics and blends. A number of publications have described the effects of tightness or openness of weave on the crease recovery of fabrics containing various fibers. Some of the general principles have been enunciated by Gruntfest and Gagliardi (*2*), while Ikeda and Okajima (*3*) have studied the crease recovery of untreated staple rayon fabrics as a function of weave, and Krasny and coworkers (*4*) have examined the effects of weave and tightness on the crease recovery of a broad range of fabrics made from filament Fortisan. The work of Reinhardt and coworkers (*6*) showed little effect on crease recovery of a range of fabric structure variations. A detailed analysis of the effects of structure on "wash-and-wear" properties does not seem to be available in the literature for any fiber or combination of fibers, although the general principles as reported would seem to indicate that as a structure becomes more open and acquires greater mobility, the "wash-and-wear" properties and crease recovery improve. It remains to be seen, however, whether this principle applies with equal validity to different types of fibers, filament and staple, and cellulose fibers at various levels of treatment.

In the course of an investigation of filament rayon lining fabrics, an opportunity was presented to make a detailed analysis of this type. Filament viscose, acetate and cuprammonium fabrics have for some time enjoyed an uncontested place in linings for ordinary suits. However, in "wash-and-wear" items, filament nylon has conventionally been used, in spite of its higher cost, presumably because of its rapid rate of drying and good "wash-and-wear" performance. The present paper originated from a desire to investigate the feasibility of using resin-treated viscose filament lining fabrics in "wash-and-wear" suits. For this purpose, a rather extensive investigation of the effects of warp and filling texture, weave, and resin concentration was undertaken.

For all of the fabrics, two properties related to appearance, "wash-and-wear" rating and crease recovery, and two properties related to serviceability, the breaking load and tearing strength, were investigated. The effects of fabric structure on these properties, and some of their interrelationships are described.

MATERIALS

The fabrics used in this study are identified in Table I. As shown by this table, the series made from 150/40 rayon contained seven 2/1 twill fabrics, varying in texture from 72 × 52 to 128 × 80. For three of the textures (the most open, the tightest, and an intermediate value) fabrics in a plain weave and a 3/1 twill were also available. Each of these fabrics was used in the untreated condition, and resin treated with two concentrations. One bath (Treatment A) contained 10 percent, the other (B) 15 percent dimethylolethylene urea solids. The catalyst, zinc nitrate hexahydrate, was used in a concentration of one percent and the softener at three percent in both baths. The fabrics were padded to a wet pickup of approximately 70%, dried at 260-

280°F, and cured at 320°F for five minutes. They were then scoured at 140°F using 0.1% of soda ash and 0.05% of anionic detergent. The nominal dry add-on of dimethylolethylene urea was 7% for Treatment A and 10.5% for Treatment B.

A fabric made from 100/40 rayon in a texture of 91 × 64 was also available in a plain weave, in the untreated state and with a nominal dry add-on of 10.5% of resin.

METHODS

LAUNDERING PROCEDURES——Two different laundering procedures were used to obtain the results described below. The first, described hereafter as "drip-dry laundering", involved washing of a four-pound load at the "warm" setting in a Maytag washing machine, with 0.1% of Vel as detergent. The "Modern Fabrics" setting (slow agitation and spinning) was used and the samples were put through a five-minute wash cycle and normal rinsings, followed by an additional deep rinse. The wet samples were removed immediately before the final spin cycle and hung, dripping wet, on a line to dry overnight.

The second laundering procedure, described henceforth as "tumble dry laundering", was similar to that described above, except that the load in the machine and the tumble dryer was two pounds rather than four. The samples were permitted to go through the spinning cycle and were then tumble dried in a Maytag dryer at 140°F for 30 minutes.

LAUNDERING SHRINKAGE——Laundering shrinkage was measured on samples which had been subjected to the drip dry laundering procedure described above. The change in dimensions was measured on an area originally 10 inches square by means of a suitably marked template.

"WASH-AND-WEAR" RATING——The samples were initially 20 inches square. After the first laundering, which resulted in considerable fraying, the edges were reinforced with a layer of Duco cement to prevent further fraying. After appropriate drip-dry or tumble-dry laundering as described above, the "wash-and-wear" ratings were assigned as follows: The samples were illuminated by fluorescent light incident on the fabric at an angle of approximately 20°. A panel of three observers then assigned numerical ratings to each sample, using a scale of 1 (poorest, like untreated fabric) to 5 (best, as ironed). The "wash-and-wear" standard photographs supplied by the Eastman Chemical Products Co were used as a guide in assigning these ratings.

CREASE RECOVERY——The crease recovery of the fabrics was measured by the Monsanto method, AATCC Tentative Test Method 66-1956, ASTM D1295-53T. The values reported represent the average of the crease recovery in the warp and filling directions, and are expressed in percent (180° equals 100%).

TEARING STRENGTH——The tearing strength was measured in both warp and filling directions, using the Elmendorf apparatus. For a number of the fabrics, a conventional tearing strength value could not be obtained in one direction, or occasionally in either direction. Thus, it was found in some instances that when an attempt was made to tear the warp yarns, the filling direction tore. This phenomenon appeared in some instances in both the warp and filling, and occasionally a yarn system tore on a bias. Generally, such occurrences were quite consistent for a given fabric. Fortunately, they did not appear in sufficient number to interfere with the interpretation of the results.

Since the warp and filling tearing strengths showed closely parallel trends, only the results for the filling (the weaker direction) are reported below. Values are presented both for samples conditioned at 65% relative humidity ("dry") and samples which were soaked in water at 21° C.

BREAKING STRENGTH AND ULTIMATE ELONGATION——These properties were measured on a pendulum-type tester using one-inch ravelled strips.

TABLE I

Identification of filament rayon lining fabrics

FABRICS MADE FROM 150/40 RAYON, WARP AND FILLING

Texture	Yarn Crossings, Thousands/sq in Plain weave	2/1 Twill	3/1 Twill	Comments
72 × 52	3.7	2.5	1.9	Each fabric available unfinished and with nominal resin add-ons of 7% and 10.5%, respectively
80 × 64		3.4		
90 × 62		3.7		
108 × 62	6.7	4.5	3.4	
114 × 64		4.9		
116 × 68		5.3		
128 × 80	10.2	6.8	5.1	

FABRIC MADE FROM 100/40 RAYON, WARP AND FILLING

	Plain weave	
91 × 64	5.8	Available unfinished and with nominal resin add-on of 10.5%

RESULTS AND DISCUSSION

GENERAL——Presentation of the results of the measurements of physical properties as a function of fabric structure requires the choice of some parameter which is best capable of expressing fabric tightness. Preferably, such a parameter should be capable of including both variations in texture and in weave. Of the several examined for this purpose, the number of yarn crossings per square inch of fabric was found to produce the most understandable results. This simple property is represented by the product of the number of ends by the number of picks for a plain weave; in the twill weaves, the number of crossings are proportionately fewer, depending on the number of yarns skipped in the float. Table I, to which reference has already been made, lists the number of yarn crossings per square inch of fabric for the 14 fabrics which were examined. The number of yarn crossings has been adopted in presenting the graphs in this paper, so that the reader may find it helpful to refer to Table I in examining the results.

The laundering shrinkage of each of the untreated and resin-treated fabrics was measured. All of the untreated fabrics shrank between five and six percent in the warp direction, and to roughly the same extent in the filling. After resin treatment at either level, all of the fabrics shrank between 0 and two percent in both the warp and filling. Since these data are not relevant to the main point of this paper, they are not presented in detail below.

"WASH-AND-WEAR" PROPERTIES——"Wash-and-wear" ratings were assigned to fabrics which had been both drip dried and tumble dried. Since the object of this work

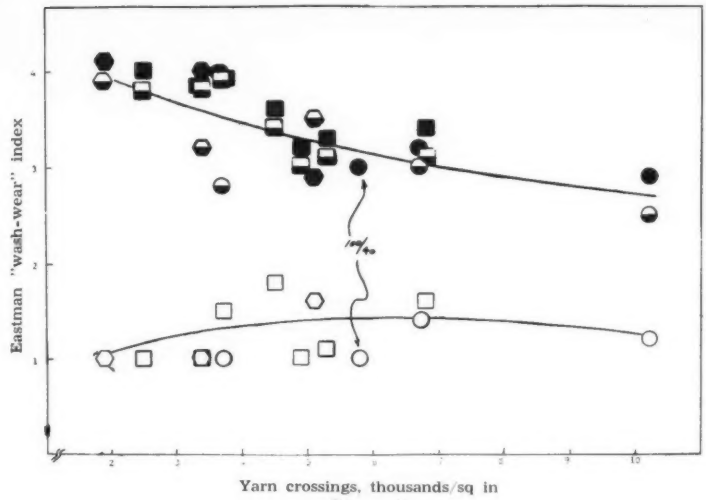

Figure 1
Relationship of "wash-wear" index to yarn crossings per square inch. Fabrics tumble dried.

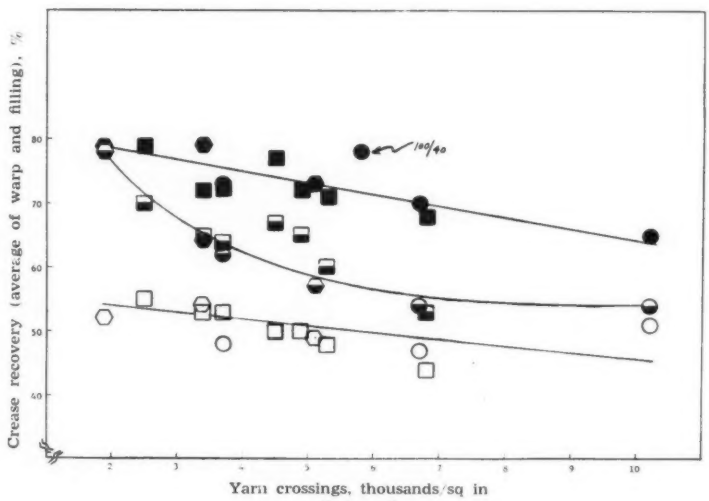

Figure 2
Relationship of crease recovery to yarn crossings per square inch

was to develop a fabric suitable for "automatic wash-and-wear", and since the values obtained after tumble drying show the effects of fabric structure more clearly, the drip-dry ratings are not presented in detail here. It is perhaps worth noting, however, that the ratings obtained after drip drying were significantly lower than those obtained after tumble drying, averaging approximately 1.5 "wash-and-wear" units less for those fabrics which had been resin treated.

In all figures but Number 3, the horizontal axis represents the tightness of the fabric as measured by the number of yarn crossings per square inch; as indicated above, this parameter includes the effect of both weave and texture. The symbols used in all figures are explained below:

Weave (Shape of symbol)	*Finish (Extent of filling of symbol)*	*Dry vs wet (Tag vs no tag)*
Plain	Untreated	Dry
2/1 Twill	7% Resin	Wet
3/1 Twill	10.5% Resin	

Figure 1 shows the effect of fabric structure on the "wash-and-wear" index after tumble drying. In the untreated fabrics, there was little or no consistent effect of fabric structure over a very broad range of tightness. In contrast, there was a rather consistent improvement in "wash-and-wear" index of the resin-treated fabrics as the number of yarn crossings per square inch was reduced, ie, as the fabric became more open. It is interesting to observe on this graph that the use of the number of yarn crossings as the independent variable reduced all of the data for the treated fabric to a single curve, regardless of the weave. Thus, the circles, squares, and hexagons, representing plain weaves, 2/1 and 3/1 fabrics all fall around a common curve. Furthermore, little or no improvement in "wash-and-wear" index was produced by the use of the higher add-on of resin in this series of fabrics. Finally, the results for the fabrics produced from 100/40 rayon fell quite close to the curve representing the family of 150/40 fabrics, though this was a lighter fabric.

CREASE RECOVERY——Figure 2 presents an analogous graph showing the effect of fabric structure on the crease recovery of the filament rayon lining fabrics. The results fall on three distinct lines, representing the three levels of treatment. For each of them, the data again appear to fall on a single curve regardless of weave.

The results for the untreated fabrics (open symbols) show a rather small but apparently consistent improvement in crease recovery as the fabric structure was made more open, either by reducing the texture or increasing the float. These results are consistent with the data reported by Krasny (4). The intermediate curve (half-closed symbols) representing the data for the fabrics with a nominal resin add-on of 7%, shows a larger effect. In this curve, there was a large and consistent increase in crease recovery as the fabric structure was made more open. The uppermost curve, representing the higher level of resin treatment, shows a similar, but again small effect. These data are consistent with the reasonable concept that untreated fabrics are relatively low in crease recovery regardless of their openness, while with a high add-on of resin all of the fabrics have a relatively high crease recovery, which is only slightly influenced by fabric structure. At an

intermediate level of resin treatment, the effect of fabric structure can apparently manifest itself most clearly. The point for the single available fabric for the 100/40 filament rayon fell close to that for its counterparts made from 150/40 yarns.

Figure 3 portrays the relationship between the tumble dry "wash-and-wear" index and the crease recovery. In resin-treated cotton fabrics, it is often assumed that a close functional relationship exists between these two properties, and this point has been made by Williams (7). Figure 3 shows that with the present fabrics there was indeed a trend toward higher "wash-and-wear" indexes with increasing crease recovery. However, the slope of the curve is quite small, and the relationship is a rather weak one. Obviously, crease recovery and "wash-and-wear" index were affected differently by fabric construction and resin concentration. It would appear that closer relationships may exist with fabrics made from other fibers and of staple rather than of filament yarns.

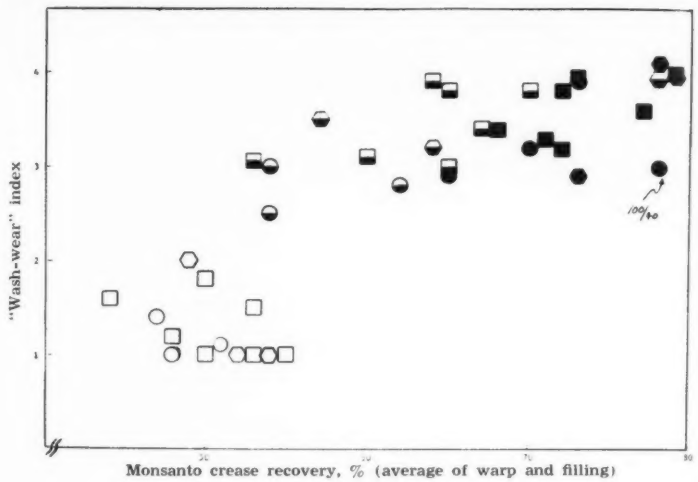

Figure 3
Relationship between "wash-wear" index and crease recovery. Fabrics tumble dried.

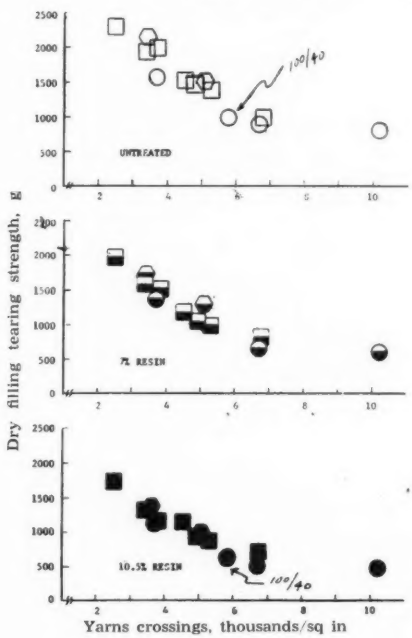

Figure 4
Relationship of dry filling tearing strength to yarn crossings per square inch

TEARING STRENGTH——Figure 4 presents the dry filling tearing strength of all of the lining fabrics. Individual graphs are drawn for each level of treatment, because of the considerable degree of over-lap between the separate curves. For all three levels of treatment, a large and consistent reduction in tearing strength was found as the number of yarn crossings per square inch was increased, ie, as the fabrics became tighter. This effect is even larger than it appears at first glance, since the more open fabrics contain less yarns; if the data were corrected for this factor, (eg, by expressing the data in grams per denier) the curves would be substantially steeper. For all three levels of treatment, the choice of number of yarn crossings per square inch as the independent variable was again effective in reducing the data to a single curve. A comparison of the three individual curves shows that the tearing strength was highest for the untreated fabrics, intermediate for those treated with a nominal add-on of 7.0 percent of resin, and was still lower at the 10.5 percent resin add-on. Even at the higher add-on, however, all of the samples had a tearing strength of more than 500 grams, which is considered adequate for most "wash-and-wear" items. The relatively low loss of tearing strength at this high add-on reflects the inherent properties of the fabric structure. Again, the fabric made from 100/40 yarn gave results which were consistent with the curve obtained for the 150/40 fabrics.

Figure 5 shows an analogous series of curves representing the wet filling tearing strength as a function of fabric tightness. The trends represented here were quite similar to those found for the dry tearing strength, but in these data there was some separation of results based on the weave. Thus, the fabrics made in a 3/1 twill weave were generally higher in wet tearing strength than the average, and the plain weave fabrics were generally slightly lower. This tendency is most apparent in the part of Figure 5 representing the data for the fabrics treated with a nominal add-on of 7% of resin. It is also interesting to note that the latter fabrics had higher tearing strengths than their untreated counterparts. The fabrics treated with a nominal add-on of 10.5% of resin were, on the other hand, similar in tearing strength to

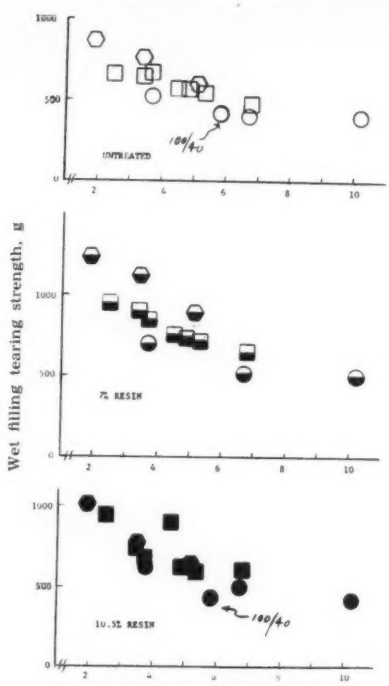

Figure 5
Relationship of wet filling tearing strength to yarn crossings per square inch

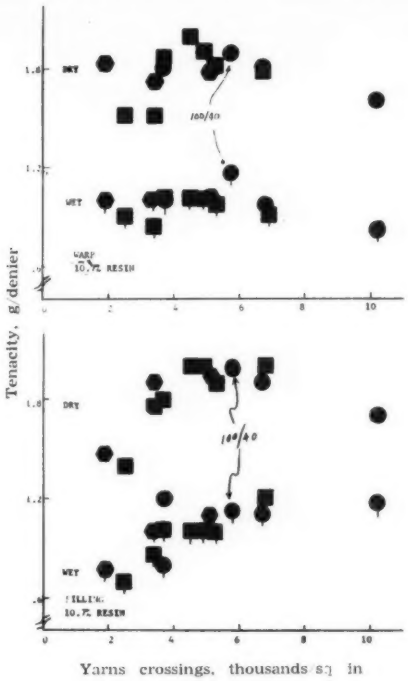

Figure 6
Relationship between tenacity and yarn crossings per square inch. Fabrics treated with 10.7% nominal resin add-on.

the untreated controls. Again, the fabric made from 100/40 yarns did not appear to fall far from the curve of those made from 150/40 yarns.

BREAKING STRENGTH AND ULTIMATE ELONGATION —— The actual breaking strengths (in pounds) and ultimate elongations of the fabrics are presented in Tables II and III. As a matter of convenience in examining the trends, Table II presents the data for all of the 2/1 twills made from 150/40 yarn, while Table III presents a comparison of the data for plain weave, 2/1 twill and 3/1 twill, respectively. As might be expected, both tables show an important effect of texture, in that as the number of yarns increased, the breaking strengths also increased. Similarly, the greater crimp resulting from increased texture also produced an important rise in ultimate elongation.

TABLE II

Effect of texture variations on some physical properties of viscose filament lining fabrics

2/1 TWILLS, 150/40 YARN IN WARP AND FILLING

Fabric Texture		*72 × 52*	*80 × 64*	*90 × 62*	*108 × 62*	*114 × 64*	*116 × 68*	*128 × 80*
Yarn crossings, thousands/sq in		2.5	3.4	3.7	4.5	4.9	5.3	6.8
Breaking load, dry, lbs								
Untreated,	W	40	42	60	66	62	65	77
	F	25	36	37	38	33	44	53
7% Resin,	W	51	46	67	66	80	76	97
	F	27	42	33	44	43	45	54
10.5% Resin,	W	37	41	56	71	71	71	76
	F	24	37	38	41	41	44	53
Ultimate elongation, dry, %								
Untreated,	W	13	14	19	21	18	19	23
	F	17	20	25	25	23	23	27
7% Resin,	W	14	12	16	13	10	16	22
	F	17	20	17	20	21	20	24
10.5% Resin,	W	8	9	11	14	13	14	17
	F	13	15	16	17	18	17	19
Breaking load, wet, lbs								
Untreated,	W	21	20	28	30	33	34	35
	F	12	14	18	15	17	19	22
7% Resin,	W	22	22	35	42	43	40	46
	F	14	21	20	24	24	27	28
10.5% Resin,	W	21	23	32	37	38	38	39
	F	12	18	21	22	22	23	33
Ultimate elongation, wet, %								
Untreated,	W	21	19	27	27	28	28	29
	F	20	25	29	29	31	29	31
7% Resin,	W	14	13	18	19	19	18	25
	F	17	18	21	23	24	24	27
10.5% Resin,	W	10	11	13	14	15	16	18
	F	13	16	16	18	18	18	23

The effect of fabric structure on the tenacity (in grams per denier) is shown in Figure 6 for measurements made in the dry and wet state, respectively. The data are presented only for the higher level of resin treatment. As shown in Figure 6, the warp tenacity shows little effect of fabric structure within the range investigated, although there was apparently a slight decrease in strength as the number of yarn crossings was raised. In contrast, the filling tenacity showed a maximum in the middle range of yarn crossings per square inch, and was lower at the extremes, particularly for the more open fabrics. This latter result is rather difficult to explain and is not consistent with results reported in the literature on this subject (*4*). It may conceivably relate to the difficulty of obtaining a legitimate breaking strength on some of the very sleazy fabrics included in the series. It is interesting to note that the shapes of the curves

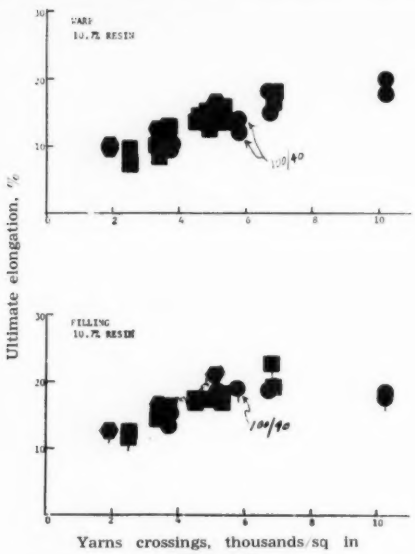

Figure 7
Relationship between ultimate elongation and yarn crossings per square inch. Fabrics treated with 10.7% nominal resin add-on.

for measurements made in the dry and wet states were quite similar, and that the results for 100/40 fabrics again fell quite close to the parent curves.

Figure 7 shows the relationship between the ultimate elongation and fabric structure. Again, only the data for the fabrics treated with higher resin content have been included. The results for both the warp and filling showed a gradual increase in ultimate elongation with increasing number of yarn crossings per square inch, presumably resulting from the increased amount of crimp built into the yarns. At this level of resin treatment, the results for dry and wet measurements were quite similar, reflecting the reduced swelling and extensibility of resin-treated yarn in the wet state. Again, the results for 100/40 fabric fell near the curve.

SUMMARY

The results presented above show the important influence of fabric tightness, as measured by the number of yarn crossings per square inch, on several of the functional properties of filament rayon lining fabrics. Thus, as the fabric becomes more open or the weave contains longer floats, the crease recovery, "wash-and-wear" index and tearing strength improve to one degree or another. The utilization of yarn tensile strength, however, is optimal in the middle range of fabric tightness. The results also confirm the well-known fact that rayon is able to sustain a rather heavy resin treatment without severe embrittlement. Thus, the results in the present report indicate that even a treatment as heavy as 10.5% resin add-on is suitable for filament rayon fabrics of this type, and that a level of "wash-and-wear" performance adequate for "automatic wash-and-wear" garments can be attained within the normal range of lining constructions.

The question as to which construction to choose for a filament rayon lining involves a balance of a number of factors. While increasing openness and length of float produce the desirable effects mentioned above, the sleaziest fabrics in this series are so open that they exhibit an intolerable degree of yarn shifting. Thus, while some reduction in texture should be beneficial, the most open fabrics could be expected to provide a source of difficulty in the ordinary handling and sewing operations involved in the fabrication of a garment. The results also suggest that a certain amount of benefit could be derived from going from a 2/1 to a 3/1 twill, which change should produce an improvement in the properties obtained with a given amount of filament rayon.

TABLE III

Effect of weave variations on some physical properties of viscose filament lining fabrics. 150/40 yarn in warp and filling.

Fabric Texture		— *72 × 52* —			— *108 × 62* —			— *128 × 80* —		
Weave		*Plain*	*2/1*	*3/1*	*Plain*	*2/1*	*3/1*	*Plain*	*2/1*	*3/1*
Yarn crossings, thousands/sq in		3.7	2.5	1.9	6.7	4.5	3.4	10.2	6.8	5.1
Breaking Load, dry, lbs										
Untreated	W	41	40	40	68	66	64	75	77	80
	F	26	25	22	42	38	36	45	53	53
7% Resin	W	50	51	32	79	66	67	93	97	99
	F	32	27	24	42	44	42	47	54	54
10.5% Resin	W	43	37	44	64	71	62	68	76	77
	F	21	24	25	40	41	40	45	53	52
Ultimate elongation, dry, %										
Untreated	W	13	13	15	25	21	20	28	23	22
	F	19	17	18	26	25	19	26	27	26
7% Resin	W	13	14	11	19	13	13	21	22	21
	F	19	17	14	22	20	20	19	24	22
10.5% Resin	W	10	8	10	15	14	11	18	17	14
	F	13	13	13	19	17	17	19	19	18
Breaking load, wet, lbs										
Untreated	W	21	21	18	32	30	30	31	35	41
	F	12	12	9	19	15	14	20	22	23
7% Resin	W	24	22	24	39	42	29	37	46	53
	F	16	14	13	25	24	20	27	28	30
10.5% Resin	W	24	21	25	35	37	36	35	39	44
	F	13	12	13	23	22	21	26	33	30
Ultimate elongation, wet, %										
Untreated	W	24	21	17	31	27	23	35	29	32
	F	24	20	19	28	29	23	25	31	36
7% Resin	W	15	14	15	23	19	15	28	25	26
	F	21	17	16	27	23	20	25	27	27
10.5% Resin	W	11	10	10	18	14	13	20	18	17
	F	16	13	13	20	18	17	18	23	21

ACKNOWLEDGMENT

The numerous fabric measurements were faithfully carried out by Leo Peloquin and Ruth K Stoller of Harris Research Laboratories, and by personnel of Enka's Research Textile Laboratory under the supervision of Carl E Nifong.

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Western New England Section——

THE DYEING OF VINAL STAPLE*

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VINAL, by American Federal Trade Commission definition, is the generic term for fibers composed of at least 50 percent of vinyl alcohol units and at least 85 percent by weight of a combination of alcohol and acetal units.

Vinal staple, as marketed by the Air Reduction Co, is manufactured by spinning an aqueous solution of polyvinyl alcohol into sodium sulfate solution. The resultant fiber, which is water-soluble, is then stretched, heat treated and finally acetalized with formaldehyde, which renders the fiber insoluble in boiling water. A series of aldehydes can be used in the acetalizing process to give fibers of widely varying characteristics. For the purpose of this article, the product of the formaldehyde acetalization which is currently being marketed by the Air Reduction Co will be discussed.

PROPERTIES AND END USES ——Before discussing the dyeability aspects of vinal, it will be well to discuss briefly the properties and end uses both in this country and overseas.

Vinal staple is distinguished for its high tenacity, which ranges from 4.5 to 5.5 gpd in 1.0-, 1.4-, and 3-denier staple fiber. This property, coupled with those of resistance to microbacteriological decay, resistance to weathering and ability to dry rapidly has made vinal a very important fiber in the fishnet and rope trades where upwards of nine million pounds of fiber are used annually.

Vinal fibers make major contributions to tear strength and abrasion resistance and in conjunction with the aforementioned properties have found extensive use in woven fabrics for outdoor uses, such as tarpaulins, tentage, hatch and truck covers. These end uses have been developed at the expense of cotton and other synthetic fibers, and when it is considered how cheaply cotton goods can be made in Japan compared with those of vinal, then the inherent money value of the latter appears to have been amply demonstrated.

In the industrial field a wide range of fabrics for a variety of purposes is being developed in this country, among them being conveyor belts, hose ducks and filter fabrics and particularly those fabrics required for the coated field where efficiency of bonding between vinal and rubber is of a very high order.

Also in this country the use of vinal is being explored in knit underwear, outerwear and pile fabrics for liners and coating purposes. The moisture absorbency of vinal is appreciably higher than that of most synthetic fibers, which makes for body comfort. In fine deniers there is a pleasing softness of hand which is applicable in a range of knitting uses.

The use of vinal in the field of domestics is being explored particularly in upholstery and carpets. Vinal in these uses has excellent abrasion resistance, a low rate of soiling, good cleanability and very high lightfastness potential.

In order to make the dyeability presentation which follows more meaningful, the above examples of the fiber end uses have been given but in no way should these be considered restrictions, for by the addition of American ingenuity the fiber is finding its way into a multiplicity of additional and sometimes unanticipated end uses.

Polyvinyl alcohol fibers have been in commercial production for several years, chiefly in Japan. Much of the earlier research work was done in Germany, where initially a water-soluble fiber was produced. No major uses were found for this material and it remained for the Japanese to continue the work and eventually develop a water-insoluble fiber.

WET PROCESSING——The wet processing of 100 percent vinal fabrics follows conventional lines with one minor exception. Fabrics are singed with a broad, low temperature flame and desized conventionally for the warp size used. Vinal has an excellent initial whiteness, and scouring need only be carried out for fabric cleansing purposes. In such cases a suitable nonionic scouring material may be used at any temperature found to be satisfactory for the removal of the specific soil. Bleaching is carried out either with the hypochlorites or sodium chlorite in conventional fashion. Bleaching takes place readily and excellent whites are obtained, especially when supplemented by the optical bleaches used for cotton. Care must be taken to antichlor completely to remove the danger of subsequent high-temperature yellowing.

The dry softening temperature of vinal is high, between 420-435°F; but the wet softening temperature is just above the boiling point of water, namely 218°F. Under practical mill applications this condition is not reached except by design; but the results of a threshold approach to these conditions are manifested by a stiffening of hand. Unless drying is carried out under the most extreme conditions, this stiffness is not of a permanent nature and can be broken down by mechanical action. The stiffness can be avoided completely by staggering drying cylinder temperatures or by wrapping the initial cans. It is apparent that the rate of moisture removal is important, but once substantially removed, high

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temperatures may be used without adverse effects.

When blended with cotton, vinal follows the conventional cotton process using hypochlorite except for pressure boiling. Mercerizing of such blends is carried out conventionally. In bleaching, the vinal component whitens at an appreciably faster rate than the cotton. Attention to drying temperatures is not as important in the presence of cotton. Complete antichloring is extremely important.

DYEING———Examination of the dyestuff classes used on vinal, namely, direct, sulfur, vat, naphthol, disperse and neutral metal complex, indicates aspects of dyeability common to both cellulosic and synthetic fibers. The unacetalized hydroxyl groups of polyvinyl alcohol are the source of vinal's dyeability with cellulosic dyestuffs, but their accessability, due to the effect of orientation and crystallinity brought about in the heat treatments and acetalization, is not the same as for cellulose. This results in a restriction as to number of direct dyestuffs that can be used to the same extent as they can be used on cellulosic fibers. As a broad generalization, it can be stated that dyestuffs containing more than three sulfonic groups have low substantivity, but those dyestuffs with an excess of amino groupings over sulfonic acid groupings, in many cases, have substantivity equal to that of cotton. These are not the only factors involved, however, for it seems that the direct dyestuffs of a simple constitution and lower molecular weight can be used to the same advantage as on cellulose. Conversely, more structurally complex dyes with higher molecular weights have lower tinctorial values. The following is a listing of direct dyestuffs with a substantivity on vinal equivalent to that on cotton:

CI Direct Red 1	CI Direct Brown 1
CI Direct Yellow 1	CI Direct Black 38
CI Direct Green 8	CI Direct Red 28
CI Direct Violet 12	CI Direct Green 6
CI Direct Red 2	CI Direct Violet 11
CI Direct Orange 7	CI Direct Brown 2.
CI Direct Blue 12	

The dyeing rate of many of these dyestuffs is closely similar to that of the cellulosics with the result that a wide range of union shades can be obtained in vinal-cellulosic blends by a conventional direct dyeing operation. A phenomenon initially associated with the dyeing of vinal, not only with direct dyestuffs but with other classifications of dyestuffs also, was that, although many dyestuff solutions visually showed a complete exhaustion, the dyed vinal appeared appreciably lighter than could be logically expected in relation to the quantity of dyestuff used. Cross-sectional examinations of the dyed vinal fibers showed that the fiber core was usually very appreciably heavier in shade than the fiber skin with the overall effect lighter in shade than was warranted by the amount of dyestuff actually known to have been efficiently utilized. Fibers so dyed, when subsequently damaged, showed a darkening of shade which is, of course, a result reverse from normally encountered. This skin-core effect has been minimized by fiber manufacturing changes with the result that the scope of economically usable dyestuffs has considerably expanded.

Color fixatives, such as are conventionally applied to direct dyestuff on cellulosics, are also used on vinal with substantially similar results.

Dyeing temperatures in excess of 185°F are not required in the direct dyeing of vinal and indeed, dependent upon the exhaustion rates of individual dyestuffs, temperatures of 165°F can be used advantageously. Materials for dyebath exhaustion are used in the same way as for cellulosic fibers. Barium chloride, magnesium chloride, and ammonium chloride are all effective in increasing exhaustion rates of direct dyestuffs.

SULFUR DYESTUFFS———Sulfur dyestuffs can be applied to vinal by methods substantially the same as for cotton. For the most part, this type of dyestuff has lower saturation levels on vinal than cotton, though not so grossly different as to prevent excellent union dyeing in vinal cotton blends. In a number of cases the shade obtained for a given dyestuff is unaccountably different on vinal from cotton. Sulfur dyestuffs have low ability to transfer, hence the need for a uniform presentation of the vinal material to the dyestuff solutions. Certain auxiliary products based on cetyl betain have a marked effect upon leveling and may also be used to reduce overall shade depth when reprocessing.

The class of sulfur dyestuffs currently sold in soluble form has been used to great advantage, particularly in the dark shade area, but with powdered sulfur dyes the use of sodium sulfide ranges from equal to one-half of the dyestuff weight. The oxidation rate is usually appreciably lower for sulfur dyestuffs on vinal compared with cotton and, therefore, acceleration of conventional oxidizing methods can be used to advantage.

The chief advantage of sulfur dyestuffs on vinal is the relative cheapness of dyeing in relation to good washfastness and fairly good lightfastness. The weakness of sulfur dyestuffs to chlorine washing still pertains when they are applied to vinal. As in the case of cotton, an excess of surface dyestuff produces crocking and this is best controlled by use of appropriate auxiliaries based on cetyl betaine.

VATS———Vat dyestuffs are used on vinal for the same reason that they are used on cotton, namely to give higher all-round fastness, but usually at a higher cost. Vat dyestuffs have a markedly lower degree of substantivity on vinal than cotton and attempts to build up the shade beyond saturation levels results in low crockfastness. The anthraquinone types are largely used in the light to medium shade area. Beyond this point the indigoids and thioindigoids are used. The lightfastness of a number of indigoids on vinal is vastly superior to that on cotton. Essentially the same dyeing method is employed as is used on cotton except that some of the IK types can advantageously utilize higher bath temperatures.

In blends with cotton, a wide range of union shades can be produced and the guiding principle of control appears to be that at higher temperatures vat dyestuffs transfer from cotton to vinal. Oxidation of vat dyestuffs appears to be slower on vinal than cotton, hence the need for accelerated oxidation techniques.

The following is a list of vat dyestuffs found to have been suitable for vinal:

CI 60750	CI Vat Blue 43
CI Vat Yellow 2	CI Vat Orange 2
CI Vat Blue 4	CI Vat Green 9
CI Vat Red 1	CI Vat Violet 1.
CI Vat Green 1	

METAL COMPLEX DYESTUFFS———The metal complex dyestuffs, particularly those in which each metal is associated with two azo groups, are probably those with the greatest all-round value for vinal. Shades from pastel to black may be obtained by methods similar to those used on wool although usually employing 20 to 30 percent more dyestuff per given shade. The lightfastness obtained is of a very high order, ranging from 6 to 8 at 2% levels. Washfastness is good under conditions of AATCC #2 Test. Dark

shades obtained by this method are not as prone to the minor crocking problems associated with dark shade vats or sulfurs.

A number of dyestuffs in the metal complex classification have rapid strike and retardants are frequently used to protect against too fast action. However, slight excesses of such retardants effect a complete cessation of dyeing, so care is required to determine precise quantities for each group of dyestuffs. Saturation levels can be increased by the addition of magnesium chloride. Addition of acid appears to be of no value.

Union shades in blends with wool can be piece dyed by using the neutral metal complex dyestuffs by regular dyeing means. Vinal, having the faster dyeing rate, initially dyes somewhat more heavily, but at high temperatures the dyestuff transfers from the vinal to the wool to give union shades. Addition of acid at the outset of the dyeing operation, however, produces a dyeing of the wool almost to the exclusion of the vinal.

For the general all-round purposes, the neutral-dyeing metal complex dyestuffs afford the best means of dyeing vinal. In addition to their use as a primary dyeing means, this class can also be used to "fill in" vinal in blend dyeing with other fibers.

ACID AND MORDANT DYESTUFFS——A widely differing range of results is obtained with the use of acid dyestuffs. In some cases shades up to the dark medium area can be obtained, but in others only light staining results. Good wetfastness in up to the medium shade level can be obtained by using metachroming techniques, but opportunities for such use are infrequent.

DISPERSE DYESTUFFS——This classification comes under the heading of "easy on, easy off", although giving good value tinctorially. The overall lightfastness is substantially superior to that obtained on cellulose acetate.

CATIONIC DYESTUFFS——Basic dyestuffs have limited affinity—fair lightfastness and poor wetfastness, and in the present state of knowledge have no value.

NAPHTHOLS——Naphthols may be applied to vinal by what are now established techniques for man-made fibers, that is, by the simultaneous application of base and naphthol. Crocking, as usual, is the chief problem in the obtaining of reds and bordeaux shades. Navies and blacks can be obtained in satisfactory fashion. One point of difference between the processes established for synthetic fibers and vinal is that diazotization is carried out at higher temperatures, namely 20-30°C using five gpl sodium nitrite and three gpl hydrochloric acid.

The shade range available is not as comprehensive as for cotton and naphthols are used on vinal for specific rather than general purposes.

In summary then, the classes of dyestuffs that are most generally used on vinal are direct, sulfur, vat and metal complex, each in relation to the requirements of shade, fastness, cost and related blended fiber. Dyeing methods are conventional and in no case can pressure dyeing be attempted without degradation of fiber properties. Of the carriers, only phenol and cresol have shown minor advantage and not of sufficient value to warrant complicating simple dyeing systems.

FINISHING——Vinal polyvinyl alcohol fiber can be softened readily by the use of a wide range of cationic materials usually requiring one-half to one-third the quantities required for the hydrophobic fibers. In blends with cotton and rayon, conventional resin-finishing methods are used except that in order to obtain maximum pick-up by the vinal component an increase in immersion time is recommended.

Vinal will advantageously retain about 25 percent of the resin weight as will cotton or rayon. However, 50/50 blends of vinal and cotton show crease recovery angles closely similar to 100 percent resinated cotton. Direct color fixatives based on dicyandiamide can be included in the finish bath. Water repelling and proofing treatments are carried out by conventional methods except for the need for longer immersion times and lower drying temperatures. After drying, curing follows standard lines.

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Southeastern and Metropolitan Sections———

DEVELOPMENT OF THE STANDFAST PATENT CONTINUOUS MOLTEN METAL VAT DYEING PROCESSES*

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Director, Standfast Dyers & Printers Ltd
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INTRODUCTION

THE purpose of this paper is to make available the latest information concerning the Standfast Patent Continuous Molten Metal Vat Dyeing Processes by amplifying the information previously provided by the early article by Boardman (*1*) published by the Society of Dyers & Colourists and the subsequent report to the erstwhile New York Section of AATCC by Weidmann (*2*).

As the name implies, these processes were invented and developed at the works of Standfast Dyers & Printers Ltd, Lancaster, England as a result of the observations of William Kilby, chief chemist of the Company.

In considering the possibilities of the use of a bath of molten alloy as a heat transfer and pressure medium in the processing of textile fibers, he realized its possible usefulness in the application of vat dyes, with the result that, after investigation on the laboratory scale followed by the building of commercial-scale apparatus, this novel process has become widely adopted for the vat dyeing of cotton, rayon and linen woven piece goods and has found subsequent application to the dyeing of cotton and rayon yarns and narrow fabrics, such as tapes for the construction of zipper or slide fasteners.

DISCUSSION

LEUCO DYEING OF CLOTH——Let us first devote our attention to the primary form of the process used for dyeing of cloth by application of vat dyes in the leuco state. This orginal conception of a continuous vat dyeing range, now commonly known as System No. 1, comprised a molten metal dyeing unit, as illustrated in Figure 1, preceded by entering equipment and five preheating cylinders and was followed by an eight-cistern conventional soaping range. The molten metal dyeing unit employs a steel vessel in the shape of a large letter 'U' providing a narrow passage for the cloth of approximately 1¼", each leg of the 'U' tube being approximately 52" deep. At the base of the 'U' tube is located a solid steel roller which permits the cloth to pass freely from the downward leg to the upward leg. The width of the passage is made to suit maximum cloth webs to be processed and machines are in operation from a cloth width of 40" to a sheeting width of 100". This U-shaped vessel is filled with a molten alloy containing bismuth, tin, cadmium and lead, having a melting point of approximately 158°F. At intervals, closed coil steam heating pipes are disposed on each side of the cloth passage to maintain a controlled and uniform temperature of the molten metal of approximately 203°F. The steam supply is controlled by an automatic regulator.

On the top of the downward entering leg of the U passage is located a bottomless dyebath of small capacity projecting beneath the surface of the molten alloy so that when leuco dye is pumped into this dyebath it floats upon the surface of the alloy. Its liquor content for a normal-width machine is around two gallons. The working depth of the dye liquor within the dyebath is eight inches and is automatically controlled by pneumatically operated float equipment. As the molten alloy has a density of approximately 9, the eight-inch column of dye liquor depresses the surface of the molten metal to the extent of about one inch. At the exit side of the U-shaped tube is disposed a similar but larger bath containing a solution of glauber salt.

A most important part of the equipment required for controlled operation of the dyeing range is the provision of a miniature Molten Metal machine of laboratory size which is used for the predetermination of dye liquor recipes. The Standfast process is unique in introducing this facility whereby small strips, about three inches wide and 12 inches long, of the actual prepared cloth to be dyed are used to prepare matchings to the correct shade and permit the dye liquor recipe to be determined and the dye liquor subsequently made up awaiting the arrival of the bulk cloth at the production machine. This work is done not necessarily in the works laboratory but preferably with suitable equipment located in the dyehouse and near the machine. The person conducting these trial dyeings is provided with a bench and sink, steam-water supply and a supply of standard concentrations of vat dyestuffs in general use in the factory and with beakers and Bunsen equipment. In conducting a trial dyeing, small quantities of dye liquors and glauber salt solutions are speedily heated to correct temperatures and placed in the small dye and salt baths of the shade-pitching machine, which is motor driven at a speed to give a time of immersion in the molten metal similar to that obtaining on the large production machine. The dyed strip of cloth is then aftertreated in beakers and dried up on a hot plate or cylinder. If the correct shade matching is not achieved at the first attempt, an adjustment of dye liquor is made and the process is repeated. When the shade matching has been submitted to the foreman dyer and approved, the recipe is recorded in grams per liter and, together with the estimated volume of dye liquor required for the amount of cloth to be dyed, is transmitted to the dye mixer for preparation of the dye liquor in bulk in one of several dye mixing tanks alongside the machine. The dye liquor is mixed cold and a sample of this liquor is subsequently used to conduct a further check dyeing on another strip of the fabric to ensure that there has been no error in the mixing of the bulk dye liquor from the instructions provided. In this manner, several batches of dye liquor may be prepared in advance of their use by the dyeing range, thus ensuring continuity of operation. The caustic and hydrosulfite content are added to the dye liquor some little time prior to its use.

*Presented before the Southeastern Section on April 16, 1960, and before the Metropolitan Section on April 22, 1960

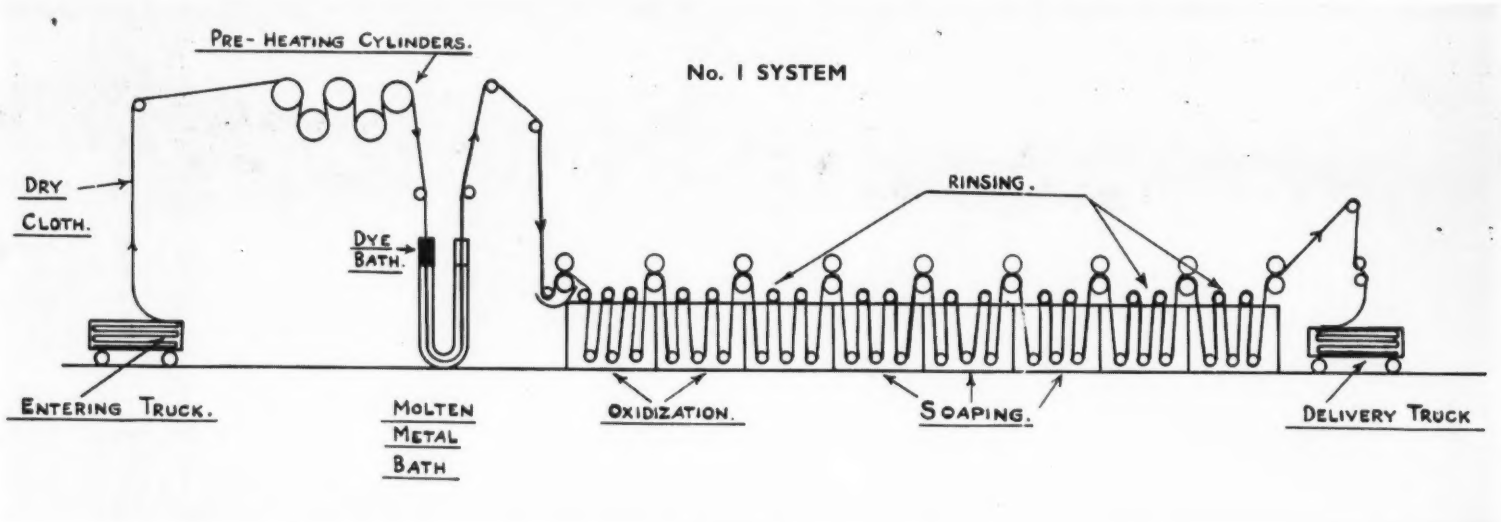


Figure 1
System No. 1

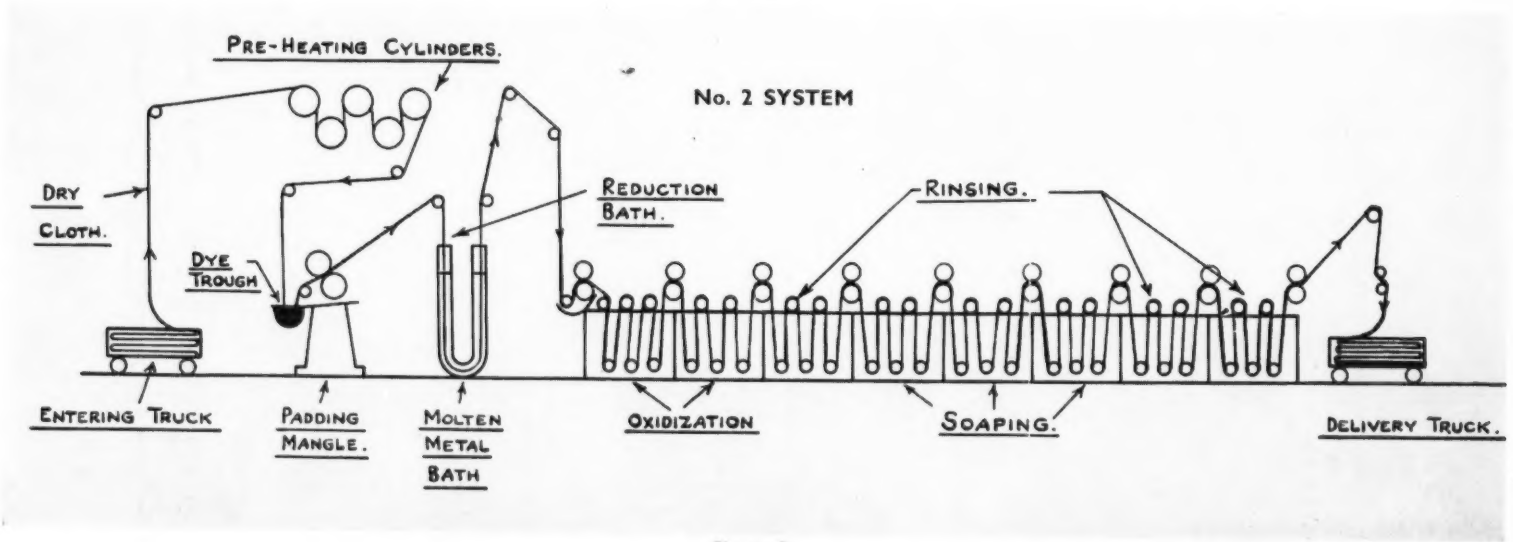


Figure 2
System No. 2

It will be appreciated that duly recording the dye recipes together with samples of the dyed cloth for future consultation, together with records of the relationship between cloth yardage and dye liquor absorbed, provides a library of information which enables the person making the trial dyeings to achieve the correct shade very quickly, or to arrange repeat dyeings; also to prepare just the correct amount of dye liquor for the particular quality of cloth to be dyed. It should here be emphasized that the person operating the bulk dyeing range is a machine operator only and makes no adjustments to the dye liquors in use during the course of a run of cloth.

The method of supplying dye to the dyebath is as follows.

At the side of the Molten Metal machine is located a dye supply tank having four separate compartments, any one of which may be connected to a motorized pump by a suitable valve control arranged for quick operation. The dye liquor required for a particular batch of cloth is transferred by pump and flexible pipe from the appropriate dye-mixing tank to one compartment of this dye supply tank at room temperature. If the capacity of such compartment is not sufficient to hold all the dye liquor for a particular batch of cloth, further supplies may be transferred as the level falls, or a second compartment of the dye supply tank may also be filled.

The cold dye liquor is pumped from the dye supply tank through suitable connecting pipes and valves to a dye heater normally supplied with steam at 60-75 lbs pressure where it is heated to 167°F and becomes fully reduced to the leuco state. It is then fed through pipes to both the front and back plates of the dyebath, which are equipped with internal diffusion equipment arranged the full width of the dyebath so that the dye liquor is evenly distributed across the width of the cloth and on both sides of it.

The steam supply to the dye heater is automatically controlled so that the supply of dye liquor is maintained at a standard temperature of 167°F.

The back plate of the dyebath is fitted with a float valve attachment arranged to operate a pneumatic control valve in the dye supply line which keeps the height of the dye liquor within the dyebath at a standard level.

In order to further ensure uniform strength of the dye liquor within the dyebath, a dye-circulating pump is arranged with suction pipes connected to the dyebath from which dye liquor is drawn away to the pump and recirculated back to the dyebath.

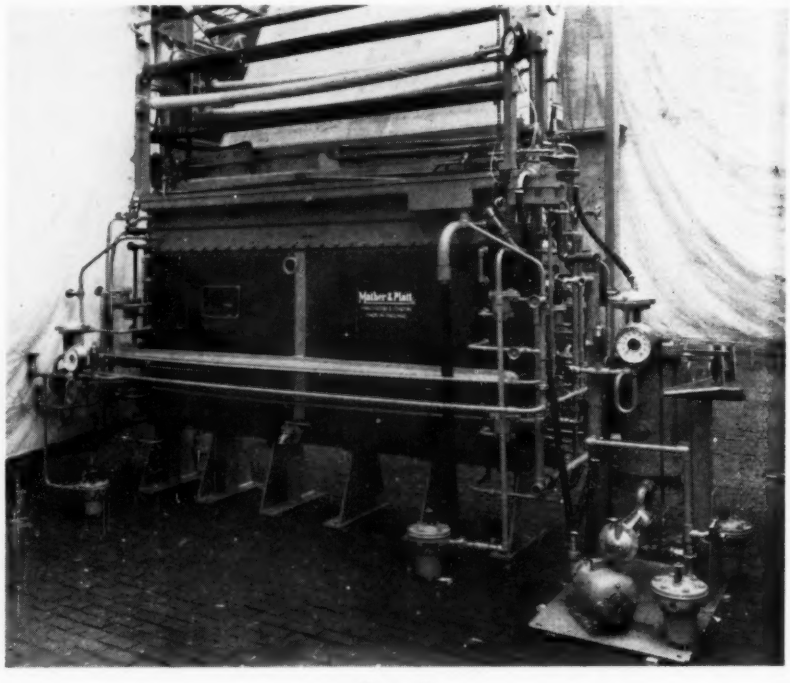


Figure 3
Standfast Molten Metal Dyeing Machine for piece dyeing of 90" cloth

The reduced dye liquor in circulation is approximately four gallons. At dyeing speeds of 40 to 120 yards per minute, the cloth is immersed in the dyebath for 0.45 to 0.15 seconds and this time is sufficient for the cloth to become thoroughly saturated with dye liquor.

At the exit side of the dyeing machine, the salt bath is supplied with salt solution pumped from two mixing tanks located on the floor alongside the machine, the supply being drawn from one tank while further supplies of the solution may be mixed in the other tank. Supplies are taken from the tanks alternatively.

A supply of hot salt solution is fed into the salt bath continually and allowed to overflow to drain, over the surface of the metal, which is thus protected from oxidation effects. Again, in order to maintain uniform conditions within the bath, a circulating pump is arranged to draw the solution from one side of the bath and discharge into the opposite side. The salt solution is maintained at an approximate temperature of 203°F.

Having described the Molten Metal Unit and the supply to it of dye liquor and salt solution, we may now trace the passage of the cloth through the range.

The dry prepared cloth is fed from wagons through a pneumatic guider and over entering rollers and the five preheating cylinders and expanders before its downward passage into the dyebath. The function of the preheating cylinders is to prevent the risk of cold cloth cooling down the molten metal at its surface, possibly solidifying the top layer and thus producing a scraping effect upon the cloth. Their use also ensures that the cloth is presented to the dyebath in a uniformly dry and absorbent condition. In its rapid passage through the dyebath, the cloth becomes saturated with the dye liquor and is immediately immersed in the molten alloy, which submits it to a uniform hydraulic squeezing pressure and heat transfer in its passage through the U tube where the amount of dye liquor remaining in the cloth is of the average order of 140% of the dry cloth weight. The immediate immersion of the cloth in the molten metal after passing through the dyebath completely excludes air from the dye-impregnated cloth and prevents pre-oxidation troubles.

It will be noted that, from the use of the very small dyebath and the short time which elapses between the complete reduction of the leuco dye liquor on its emergence from the

heat exchanger to the time of its absorption by the cloth, degradation of the dye liquor is eliminated and as the dye liquor is carried away by the cloth and automatically replaced, uniform conditions within the dyebath are sustained for an indefinite period, without the production of a tailing effect. These stable conditions operate from the first yard onward.

Owing to its characteristics as a fluid, the molten metal exerts equal pressure on the cloth from all directions and irrespective of the structure of the cloth adapts itself to variations in thickness and gives a constant proportion of liquor per unit weight of cloth. This feature is particularly useful in the dyeing of towels and other rough surface fabrics.

Vat dyestuffs of each group possessing widely different dyeing properties may be mixed freely using the quantities of reducing chemicals which have been established as most suitable to give full reduction of the vat dyestuffs when used in any desired combination. When dyeing a combination shade by the leuco-dyeing technique, the dye liquor is absorbed by the cloth in its downward passage through the eight-inch-deep dyebath. In that brief passage, mechanical pickup of dye liquor has occurred with infinitesimal dyeing of the fabric having taken place. Thus the different dyeing rates of the individual leuco dyestuffs in the combination are not factors in the system. The same proportion of each dyestuff in the combination is being carried forward on the fabric controlled by the equal squeezing effect of the pressure of the molten metal. Rapid dyeing takes place then under the intimate contact of the molten metal at the constant temperature of 203°F because the transfer rate of the leuco dye from liquor to fiber is greatly increased at this high temperature and the short liquor to cloth ratio of around 1.4:1.0.

The cloth emerges from the unit through the bath of neutral salt solution, which is floating upon the surface of the alloy at the exit side and which washes off any metal tending to adhere to the cloth and also rinses away exhausted dye and chemicals. The cloth subsequently passes forward for aftertreatment.

The aftertreatment is normally carried out in a conventional eight-cistern open soaper provided with an additional cold-water rinse and squeeze at the entering end. It is usual to employ two cisterns and an overhead airing arrangement for oxidation followed by a hot wash cistern, three soaping cisterns and then one hot wash and one cold wash cistern, the cloth then being plaited down ready for drying and finishing. If desirable, cylinder drying equipment may be incorporated in the dyeing range and this is particularly desirable where long runs to a shade are to be dyed. Where many short runs are anticipated, it may be more convenient to dry the cloth on separate machines.

This No. 1 System of vat dyeing of cloth in the Molten Metal Unit by the application of dye liquor in the leuco state floating on the surface of the molten metal is particularly useful where the trend of trade requires the dyeing of many short runs of cloth to varying shades, and as a continuous process it is unique in being efficient for this purpose. Not only is it possible to dye every yard of the run to a correct and uniform shade by virtue of the uniform conditions which may be maintained indefinitely within the small dyebath, thus particularly satisfying the requirements of commission dyers, but enormously long runs may also be achieved without tailing of shade.

CHANGING SHADES —— A most important feature of the process is the rapidity with which shades may be changed. The procedure for this operation is as follows.

At the end of each run of cloth dyed to a particular shade is sewn a piece of expendable industrial cloth, termed an end fent, of approximately 80 yards length and as the leading end of this cloth enters the dyebath, the dye mixer operates the control of the dye supply tank so that one of its compartments which is already charged with a cleansing solution of caustic and hydrosulfite is connected to the pump in place of the dye liquor previously in use. The machine operator cuts off the air supply to the dye level control so that the dyebath contents are permitted to overflow while the length of cloth already dyed is being aftertreated in its passage through the soaping range, the entire dye supply system including piping, pump, dye heater and dyebath are being thoroughly cleaned, the fouled liquor overflowing on to the surface of the alloy and away to drain. To the trailing end of the end fent is sewn the leading end of the next batch of cloth to be dyed the new shade, and when this new cloth arrives at the dyebath the machine is stopped. The cleaning process continues until the operator is satisfied that all traces of the previous dye liquor have been eliminated after which, by the manipulation of a four-way valve, the dye supply pump is used to evacuate all cleaning liquor in the dyeing system, amounting to about four gallons, down the drain; at this stage, the front plate of the dyebath, which is held in position by a rotary cam at each end, is released at one end to permit the last vestiges of cleaning liquor to flow from the dyebath to drain, after which the dyebath is resealed.

Normal conditions for the supply of dye are restored by re-operation of the four-way valve, and the dye mixer then operates the control of the dye supply tank to connect another compartment to the pump. This compartment contains the fresh dye liquor to be used for the new shade, this liquor having been transferred from a mixing tank to the dye supply tank previously. The new dye liquor is then pumped through the system and up to the dyebath where a small portion of dye liquor is allowed to overflow to ensure that no cleaning liquor remains in the dyebath before the air-operated float valve again stabilizes the level.

The dyeing range is then started up operating on the new shade, the whole operation thus described being normally completed in five to seven minutes. Should there be a drastic change of shade required, say a full blue to a pink, it may be necessary to drain and refill the glauber bath and possibly some cisterns of the soaping range, in which case, the time required may be extended to 10 to 15 minutes.

This concludes the description of System No. 1, which is the leuco dyeing process as it was operated by the early machines put into service. This form of the process continues to operate very successfully on a wide range of cloths, including furnishing fabrics of cotton or rayon or mixtures, towels and medium-weight work cloths, such as drills, shirtings and poplins dyed in the light or medium shades. Some factories have not found it necessary to make the additions to the range which are now described as necessary for its operation on the vat dyeing of the more densely woven fabrics or those composed of the more tightly twisted yarns. This method, commonly described as No. 2 System, is the Pad Wet Develop Process. (See Figure 2).

PAD-WET DEVELOP DYEING OF CLOTH——The range as previously described was very successful for handling well-prepared cloths of the first group mentioned, but due to the relatively mild squeeze of the metal did not produce the penetration required on this second group of cloths. In order to deal with this problem of better penetration, a padding mangle was added to the normal equipment for a molten metal range located in advance of the metal machine. Advantage was taken of the physical properties of the molten metal in giving an average squeeze of 140% as against the normal expression of a pad mangle of approximately 70%. In contemporary systems, dispersed vat dye is applied in a padding mangle and reducing chemicals in another similar padding mangle, and in each case the squeeze must be considerable and the degree of expression very similar in each mangle in order to achieve uniform liquor content. Under these conditions, it is essential that the cloth must be dried after padding with dispersed vat pigment dye liquors in order to ensure adequate and even impregnation of the chemical liquors, for reliable results. Such a step is not necessary in the Molten Metal Range as the cloth may receive a 70% dye liquor content at the padding mangle and be fed immediately in the wet condition through the bath on the Molten Metal Machine, which will now contain reducing chemicals heated from cold by the same means as described for the leuco dye liquor of System No. 1. At this point a further 70% or so of reducing chemicals will be absorbed, which in the passage of the cloth through the molten metal will achieve reduction of the pigment dye within the cloth, which will emerge from the machine in the fully dyed condition.

The equipment for this system includes the supply of dispersed vat pigment dye liquor from a similar four-compartment dye service tank as the one connected to the Metal Machine, to a small capacity steam-jacketed dye trough of the padding mangle, the liquor level being automatically controlled. The cloth is entered over the preheating cylinders prior to entering the padding mangle trough. As in the case of leuco dyeing by System No. 1, the dye recipes are predetermined by the use of a laboratory-size Molten Metal Machine, which, in this case, comprises a small padding mangle followed by a Molten Metal Unit so that again continuity of production is achieved by having dye liquors already mixed cold ready to pipe into the service tank as required. The time for changing color by this system is extended to 10 or 15 minutes by the necessity of cleaning the bowls and trough of the padding mangle.

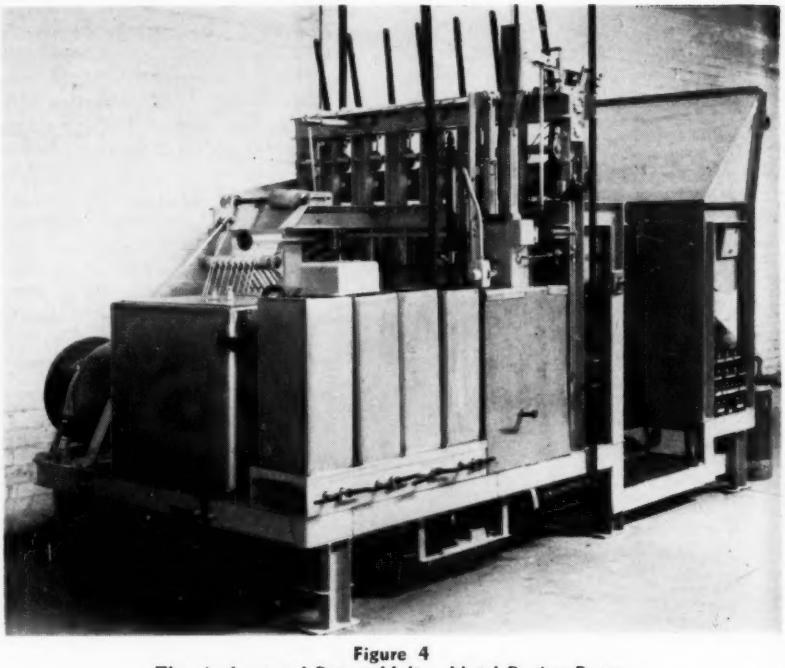


Figure 4
The single strand Patent Molten Metal Dyeing Range

The Molten Metal Range, thus completely equipped with a padding mangle, has become the standard recommended arrangement and is versatile in handling all kinds of cloths. A speedy alteration to the threading of the machine makes it suitable for Systems No. 1 or 2, ie, leuco straight dyeing or pad-wet develop dyeing, with little loss of time.

CONCLUSION

An apparent misconception concerning the process assumes that, because the process originated in the Standfast works and was quickly adopted in many other British factories where relatively short runs are a necessary feature of the commission work undertaken, the process is unsuitable for dealing with long runs. It is true that its facility for dyeing the whole of a short run correct to shade is a great advantage for the commission dyer who is exposed to claims against the quality of his work, but the process has been equally successful when used by vertically organized companies which handle long runs to a shade and is of particular value where the end use is the making-up into garments, where uniformity of color is so important.

The process attains a high degree of efficiency because of the short down time for changing colors and the fact that there is no stoppage of the bulk production range for determination of recipes or adjustments to the dye or chemical baths. It is because of the stability achieved in the chemical bath under the conditions described that tailing of shade is avoided.

The following advantages are claimed for the process:

1) Excellent predetermination of dye recipes, which permits efficient operation of the bulk machine without stoppages for dye mixing or adjustments to the dye and chemical liquors.
2) The choice of vat dyestuff combinations is unlimited in the leuco system. Hot-dyeing and cold-dyeing dyestuffs may be used together.
3) Uniformity of shade is maintained throughout short or long runs with drastic reduction of seconds and elimination of shade selection.
4) There are savings in consumption of chemicals, steam and water.
5) Time lost in changing from shade to shade is reduced to a minimum.

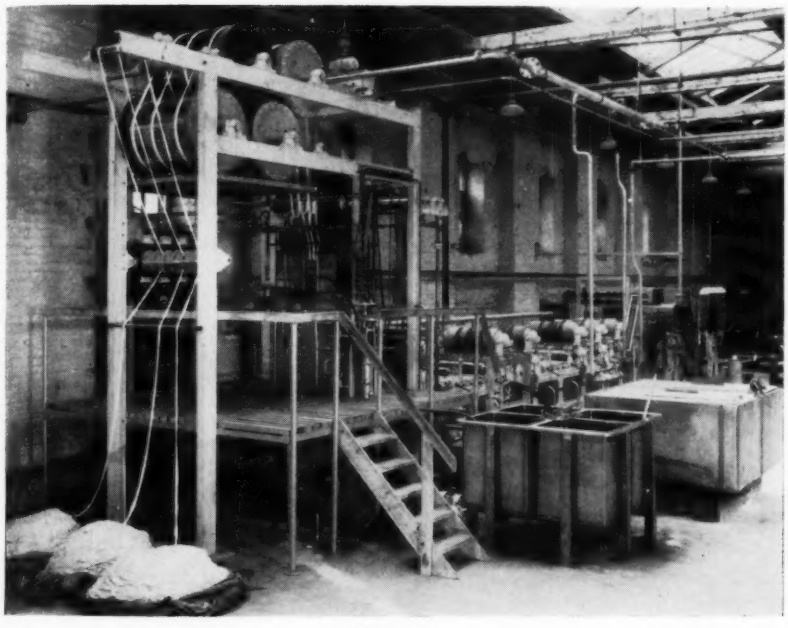


Figure 5
The Patent Continuous Metal Yarn Dyeing Range

YARN DYEING———After the foregoing work was accomplished in the field of vat dyeing of woven piece goods, it was natural that Standfast should turn attention to the continuous vat dyeing of cotton and rayon yarns intended for end use as both warp and filling. This has been achieved in dyeing by the leuco system described for piece goods, and by handling the cotton in the form of multi-strands of continuous warps.

The yarn-dyeing machines at present in operation are arranged to dye up to six or eight drafts of warps simultaneously to one shade. The range is narrower than a piece goods machine and embodies preheating cylinders and an aftertreatment range similar to a piece goods machine.

The bulk of yarns dyed are in the greige or unprepared state and are subsequently beamed for warps or quilled and rewound as weavers p'rns. The fact that the warps pass only once through the range maintains them in excellent condition for efficient and speedy rewinding.

It is claimed for this application of the process to yarn dyeing that greater uniformity may be obtained than by contemporary beam or package-dyeing methods, and by its use many dyestuffs which are difficult or impossible of application by normal package-dyeing methods can be applied successfully. In this application, the process is eminently suitable for very large quantities to a shade.

NARROW FABRIC DYEING——A further variation of the process is its recent and successful application to the dyeing of narrow fabrics and in particular cotton tapes used in the construction of slide or zipper fasteners to meet the increasing demand for vat colors in hundreds of shades particularly for end use in washable garments. A molten metal dyeing range has been designed for this special purpose handling single tapes up to 1.5 inches wide. The complete dyeing and finishing range occupies the small space of six feet by 12 feet. It operates on the No. 1 System of leuco dyeing, requiring only a few minutes for a change of shade. A user of the process employs a battery of six such machines within the factory where complete zipper tapes are made, and thus equipped, is able to give very quick delivery for any color of zipper demanded.

LITERATURE CITED

(1) Boardman, J L, *J Soc Dyers Col 66* (August, 1950)
(2) Weidmann, C J, *Am Dyestuff Reptr 40*, No. 13, P416-22 (June 25, 1951).

AATCC Calendar

COUNCIL, COUNCIL COMMITTEES, RESEARCH COMMITTEES
Sept 8-9 (Atlanta, Ga); Sept 8—Council Committees and Research Committees; Sept 9 (AM)—ECR, TCR; Sept 9 (PM)—Council
Nov 17-18 (New York, NY); Nov 17—Council Committees and Research Committees; Nov 18 (AM)—ECR, TCR; Nov 18 (PM)—Council

NATIONAL CONVENTIONS
Oct 6-8 (Sheraton Hotel, Philadelphia, Pa); Sept 28-30, 1961 (Buffalo, NY); 1962 (Southern Region); 1963—Boston; 1964—New York; 1965—Chicago

DELAWARE VALLEY SECTION
Sept 16 (Reading, Pa); Nov 4, Dec 9 (Philadelphia, Pa)

NORTHERN NEW ENGLAND SECTION
Sept 9 (Outing—Wachusett Country Club, West Boylston, Mass); Oct 21 (Hotel 128, Dedham, Mass—"Customer Service"—Arthur Swenson, J P Stevens & Co, Inc, and P J Fynn, J C Penney Co); Dec 9 (Colonial Country Club, Lynnfield, Mass—"Present-day Economic Outlook in Textiles"—William I Kent, Kent Mfg Co); Jan 20 (Hotel 128, Dedham, Mass—Symposium on "Mechanical and Chemical Finishing of Textile Fabrics"—John J McDonald, Lowell Technological Inst, D D Gagliardi, Gagliardi Research Corp, and Werner von Bergen, J P Stevens & Co, Inc)

PACIFIC SOUTHWEST SECTION
Sept 24-26 (Outing—Apple Valley, Calif); Nov 18 (Rodger Young Auditorium, Los Angeles, Calif); Dec 10 (dance)

PIEDMONT SECTION
Sept 23-24 (Hotel Charlotte, Charlotte, NC); Jan 21 (Poinsett Hotel, Greenville, SC); April 2 (Washington Duke Hotel, Durham, NC); June 9-10, 1961 (Outing—Grove Park Inn, Asheville, NC); Sept 23, 1961 (Hotel Charlotte, Charlotte, NC)

RHODE ISLAND SECTION
Sept 23 (Management Night); Oct 28 (Providence Engineering Society); Dec 2 (Annual Meeting—Johnson's Hummocks)

SOUTH CENTRAL SECTION
Sept 17, Dec 9 (Hotel Patten, Chattanooga, Tenn)

SOUTHEASTERN SECTION
Sept 10, Dec 3 (Atlanta Athletic Club, Atlanta, Ga)

WESTERN NEW ENGLAND SECTION
Sept 23 (Blake's Restaurant, Springfield, Mass); Oct 21 (Annual Meeting, Rapp's Restaurant, Shelton, Conn); Dec 2 (Rapp's Restaurant, Shelton, Conn)

ARNOLD M SOOKNE NAMED '60 OLNEY MEDALIST

ARNOLD M SOOKNE, associate director of Harris Research Laboratories, Washington DC, has been named to receive the seventeenth impression of the Olney Medal, AATCC's highest scientific award, during the 1960 National Convention at Philadelphia on October 7 during the Awards Luncheon.

The Olney Medal, which is endowed by Howes Publishing Co, Inc, publisher of *American Dyestuff Reporter*, is awarded by AATCC in recognition of outstanding achievement in the field of textile chemistry, including the development of chemical agents or chemical processes used in the manufacture of textiles, or methods for their evaluation. Its purposes are to encourage and to afford public recognition of such achievements and contributions, and to be a testimonial to Dr Louis Atwell Olney in recognition of his lifetime of devotion and multitudinous contributions to this field.

Mr Sookne's principal accomplishments have been in the fields of textile and polymer chemistry, namely: 1) studies of the relationship between chemical structure and physical and

ARNOLD M SOOKNE

mechanical properties of fibrous and polymeric materials; 2) development of methods of fiber evaluation based on single fiber properties, such measurements making possible an understanding of the importance of chemical structure and its influence on the properties of fibers, yarns, and fabrics; 3) development of chemical processes for improved water-repellent fabrics, shrink-resistant wool, and "wash-and-wear" cottons; 4) development of novel chemical compounds, namely, epoxide derivatives, for "wash-and-wear" cotton and rayons; and 5) basic chemical studies which helped elucidate the electrophoretic properties of fibers.

The nominee's accomplishments are indicated by more than forty scientific publications and half a dozen patents.

Mr Sookne lives in Silver Spring, Md. He was born October 9, 1915. He has been a member of AATCC since October 12, 1936, first as a Junior then as a Senior member. He received his BS from Brooklyn College in 1935 and an MA degree from George Washington Univ in 1942. He was a research associate at the National Bureau of Standards for the National Research Council 1937-1938; research associate at the National Bureau of Standards for the Textile Foundation 1939-1944 and joined Harris Research Laboratories as a research associate in 1945. Mr Sookne was chairman of the Technical Programs Committee of the Washington Convention last year, was chairman of the Washington Section in 1959, and has been active in many AATCC research activities.

Membership Applications

JUNE 2 - 8, 1960

NEW ENGLAND REGION

Northern New England Section

Associate

Francis J Cooley—Lab technician, Everlastik Inc, Chelsea, Mass.

CENTRAL ATLANTIC REGION

Metropolitan Section

Senior

Samuel Stowell Jr—Lab asst, Carbic Hoechst Corp, New York, NY. Sponsors: N W Akst, C G Lederer.

Transfer to Associate

Peter Turner—Textile chemist, Food Machinery & Chem Corp, Princeton, NJ.

Niagara Frontier Section

Transfer to Senior

Louis Port—Chemist, National Aniline Div, Allied Chem Corp, Buffalo, NY. Sponsors: F Sievenpiper, W H Leyking.

SOUTHERN REGION

Piedmont Section

Senior

Helmuth H Prochaska—Technical rep, Verona-Pharma Chem Corp, Union, NJ. Sponsors: G R Thompson, G M Kidder.

South Central Section

Senior

William D McCarrell—Supt dye bleach, Chas H Bacon, Lenoir City, Tenn. Sponsors: W O Neeb, J A Watt.

Junior

William H Hurley—Head dyer, Kingsboro Mills, Daisy, Tenn. Sponsors: W O Neeb, J W Dooley.

Southeastern Section

Senior

Wiley M Crittenden Jr—Salesman, Minnesota Mining & Mfg Co, Atlanta, Ga. Sponsors: W E Tiller, W B Amos.

Washington Section

Senior

Francis W Minor—Senior chemist, Harris Research Labs Inc, Washington, DC. Sponsors: A E Davis, V C Jackson.

Junior

Sandra S Warsaw—Textile lab tech, Harris Research Labs Inc, Washington, DC. Sponsors: C G Tewksbury, A E Davis.

Associate

Bert E Fry Jr—Chemist, Harris Research Labs Inc, Washington, DC.

NON-AFFILIATED

Senior

Hans Herzog—Colorist in the application dept, Rohner Ltd, Pratteln BL, Switzerland. Sponsors: G R Thompson, G M Kidder.

Peter J Padvaiskas—Boss finisher, Sudamtex Do Brasil, Dio de Janeiro, Brazil. Sponsors: E L Schlesinger, W J Murphy.

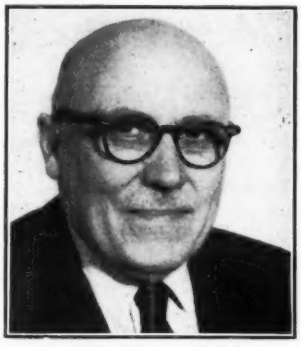
HAROLD C CHAPIN AWARD TO LEONARD S LITTLE

LEONARD S LITTLE has been named to receive AATCC's second Harold C Chapin Award. AATCC last year presented the first award to Dr Chapin, for whom the service award was named.

This award is presented annually at the AATCC National Convention to a senior member of at least twenty years continuous membership who has contributed outstanding service in enabling the Association to attain the objectives for which it was founded. The selection of the recipient is the unanimous choice of a committee consisting of one member from each of the four National Regions of AATCC. The Harold C Chapin Award is a suitably worded, framed, illuminated scroll.

Mr Little is a textile consultant who resides in New Milford, Conn and maintains a business office at 101 West 31st St, Suite 1500, New York, NY.

Mr Little is a charter member of AATCC and has served in many capacities as follows: one of the organizers of the Piedmont Section; chairman of Piedmont Section in 1926; one of three organizers of the Executive Committee on Research; chairman of Executive Committee on Research for two five-year terms; chairman of the President's Advisory Committee; chairman of the Corporate Membership Committee; active in the expansion of the New York Section during the 1940s; National Councilor (New York Section); chairman of the American delegation representing AATCC and ASA at several ISO meetings held abroad and in the United States; chairman of the International Day Committee of the Perkin Centennial held in New York during September 1956.



LEONARD S LITTLE

Mr Little is also an active member of the American Association for Textile Technology and a life member of the American Chemical Society. He has been an active member of the American Society for Testing Materials; the American Standards Association, in which he represented the Synthetic Organic Chemical Manufacturers Association; the National Cotton Manufacturers Association; the Textile Research Institute; chairman of Advisory Committee to the Federal Trade Commission on water repellency; collaborator of the Southern Regional Research Laboratory of the U S Department of Agriculture advising on research projects; and abroad as member of the Textile Institute and of the Society of Dyers and Colourists.

Mr Little has spent his entire business career in the dyeing and finishing and related chemical industries since his graduation from Brown University in 1907. He has been retained as a textile consultant on a continuous basis by E I duPont de Nemours Co, Inc and by Better Fabrics Testing Bureau since his retirement on January 31, 1951 as manager of the Textile Service Section, Organic Chemicals Department for the DuPont Company.

His previous business experience is as follows: Apponaug Co, as chief chemist and dyer; Narragansett Chemical Co, as president; U S Finishing Co, as superintendent; Pacific Mills Print Works Division, as assistant manager; Pacific Mills, as general manager at Lyman, SC; Joseph Bancroft & Sons Co, as manager; Slatersville Finishing Co, a division of Kendall Mills, as vice-president and general manager; U S Finishing Co and its subsidiaries as president and chairman of the board; and Amalgamated Dyestuff and Chemical Manufacturing Co, as treasurer and plant manager.

Elected to Membership

No designation after name indicates Senior
(A) indicates Associate
(J) indicates Junior
(S) indicates Student
* indicates transfer from another class of membership

NEW ENGLAND REGION

Northern New England Section

Thomas M Quinn

Rhode Island Section

Alva P Tetreault

Western New England Section

Alexander R Townson Jr
*Frank G Baker Jr**
*Martin I Finkelstein**
*Warner J Kraus**
*Cornelius B Westerhoff**

CENTRAL ATLANTIC REGION

Metropolitan Section

Walter A Caraccioli
Herbert H Hatch
Donald C Issing
Bryant Northcutt
August Rudler
Peter C Hereld (A)
Nathaniel P Hulton (J)
*Norman R Cohen**

Delaware Valley Section

*Robert E Hill**

SOUTHERN REGION

Piedmont Section

Milton D Barnette
Joe F Halford
John T James
James C Moore Jr
Frank G Streete
Clyde C Walters
John D Bulluck Jr (A)
Jerry Howell Jr (J)
*John G Rothell**
*Warren C Rutland**
*Howell N McGuire**

Southeastern Section

Allen A Jackson Jr
Arthur E Wood
*Hazeu R Lester Jr**

WESTERN REGION

Mid-West Section

Joe R Howlett

STUDENT CHAPTER

Auburn University

Margaret Ann Sullivan (S)

NON-AFFILIATED

Lendon W Jones
Guido Maisana
Alejandro O Bautista
Sheriar S Mistry (J)

ACTIVITIES OF THE LOCAL SECTIONS

Mid-West

MID-WEST SECTION held its second annual Ladies Night program on April 30 at the Hotel Schroeder, Milwaukee, Wis, with 118 members and guests attending.

The regular afternoon technical session was held in the Loraine Room with Raymond Thornton, technical service manager, Arnold, Hoffman & Co, Inc, serving as guest speaker. He discussed the chemistry and application techniques of the fiber-reactive dyestuffs.

A cocktail party in the Empire Room preceded dinner, both of which were highlighted by a program of entertainment.

(*See photos below*)

Metropolitan

DONALD H POWERS, vice president, Warner-Lambert Pharmaceutical Co, Inc, Morris Plains, NJ, spoke on "Recent Developments in the Cosmetic Industry" at the Metropolitan Section's Ladies Night Meeting, held May 20 at Kohler's Swiss Chalet, Rochelle Park, NJ.

In his presentation, Dr Powers covered the rapid growth of hair sprays, hair colors, shampoos, waving agents and various types of beauty creams. Also, the more recent adaptations of aerosols in pressurized containers and men's after-shave "tanning" lotions were discussed.

An orchestra provided music for dancing.

Pacific Southwest

Pacific Southwest Chairman Walter E Kramer, left, poses with two of the guest speakers at the Section's May 13th meeting: Dorothy S Lyle, National Institute of Drycleaning, and Henry F Weidman, General Dyestuff Co.

MID-WEST SECTION LADIES NIGHT MEETING

April 30, 1960 • Hotel Schroeder, Milwaukee, Wis

HEAD TABLE AT DINNER—Standing, l to r: William O Fischer, Milwaukee Dyeing and Bleaching Co; James E Miller, Best Foods Div of Corn Products Co, secretary; Frank S Stover, Koppers Co, Inc, vice chairman; Archie G Alexander, Arkansas Co; James L McGowan, Morgan Dyeing & Bleaching Co, chairman. Seated, l to r: Mrs Fischer, Mrs Stover, Mrs Alexander

Pacific Southwest

PACIFIC SOUTHWEST SECTION held its third meeting of the year on May 13 at the Rodger Young Auditorium, Los Angeles, Calif, with 35 members and guests in attendance. Following dinner, guests and new members were introduced by Chairman Walter E Kramer, Jenkins Wright Co, Inc.

First speaker of the evening was Dorothy S Lyle, National Institute of Drycleaning, who spoke on "Problems of Drycleaning Related to Dyeing." Illustrations were given showing the effect of drycleaning solvents on various dyes.

Second speaker was Henry F Weidman, General Dyestuff Co, on the subject "Recent Developments in the Application of Dyes to Synthetic Fibers". Mr Weidman covered a wide range of synthetics as well as some blends.

Final speaker was George A Willson, State Assemblyman, member of the Southern California Delegation Legislators, and a co-author of the Burns-Fisher Water Bill (1106). Mr Willson gave a brief, but complete report on the water situation in the future of Southern California.

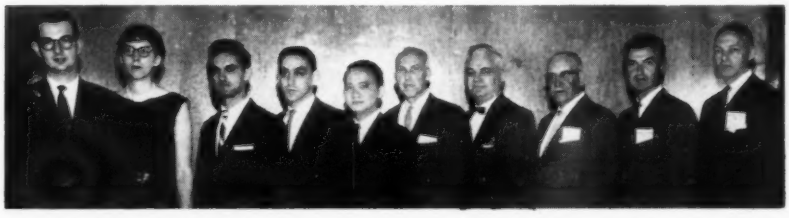
Each of the talks was followed by a short question-and-answer period.

Northern New England

THE annual joint meeting of the Northern New England Section and Lowell Technological Institute Student Chapter was held May 13 at Lowell, Mass, with NNE Section Chairman Robert D Robinson, Bachmann-Uxbridge Worsted Co, presiding.

Dinner was served in the LTI Cafeteria in Smith Hall, following which the group adjourned to Eames Hall Lounge for a program which featured two papers, "Reactions of Diisocyanates with Wool" by Ronald S Perry, LTI graduate student, and "Comparative Study of Resin Stripping" by John J McDonald, LTI professor, and Edmund Pua, LTI graduate student.

The annual outing of the Northern New England Section will be held September 9 at the Wachusett Country Club, West Boylston, Mass.



L to r: Ronald S Perry, LTI, student speaker; Francis Davis, secretary, LTI Student Chapter; John J Santos, chairman, LTI Student Chapter, award recipient; Herbert Zaristky and Jimmy Tee, LTI, Louis A Olney Book Prize recipients; Robert D Robinson, Bachmann-Uxbridge Worsted Co, chairman, NNE Section; Gerald F Quigley, Agawam Dye Works, National Councilor, NNE Section; Geo O Linberg, Melrose Chemical Co, past president, AATCC; Martin J Lydon, president, Lowell Technological Institute; George P Paine, executive secretary, AATCC

L to r: Donald H Thomas, National Aniline Div, NNE Sectional Committeeman; Gerald F Quigley, Agawam Dye Works, National Councilor, NNE Section; William B Luce, Dyecraftsmen, Inc; Edmund O Pua, LTI, student speaker; John R Markgren, W C Durfee Co, Inc, NNE Dining Committee chairman; Robert W Legge, Draper Bros Co; Edward J MacNamara, Hamilton Chemical Corp, vice chairman, NNE Section

L to r: Bennett S Gesmer, Dyecraftsmen, Inc, NNE Sectional Committeeman; Joseph S Panto, Fabric Research Laboratories, Inc, secretary, NNE Section; Robert J Peirent, professor, LTI, National Councilor, NNE Section; Albert J Carbone, Sandoz, Inc; Henry M Szczepanik, Polyvinyl Chemicals, Inc

Dining at the LTI cafeteria

Western New England

WESTERN NEW ENGLAND SECTION honored its past chairmen during its annual Ladies' Night Meeting held at Rapp's Paradise Inn, Ansonia, Conn, on May 6. Seventy members and guests were present.

George O Linberg, past president, AATCC, served as toastmaster and introduced each of the Section's past chairmen, who were presented with certificates commemorating their services to the Section. Past chairmen in attendance included Edward Lynn, Raymond Carey, Arthur Nyquist, Socrates Vaniotis, Thomas Gillick, Andrew Goodwin, and Rudolph Geering.

Chairman Albert Rant read a telegram from George Paine, executive secretary, AATCC, congratulating him and the Section on achieving 163 members, thereby entitling Western New England to two Councilors in the coming year.

Among the honored guests present at the meeting were AATCC President Weldon Helmus and Mrs Helmus.

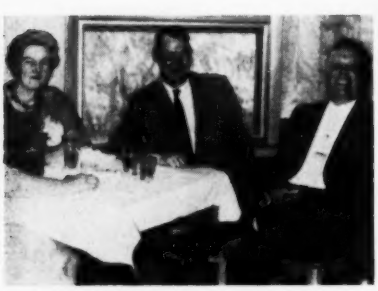
Entertainment was furnished by the Housatonic Chapter, Society for the Preservation and Encouragement of Barbershop Singing in America, Inc.

Western New England Section honored its past chairmen on May 6. Seated, l to r, are Arthur Nyquist, Albert Rant (present chairman), Geo O Linberg, toastmaster; and J Edward Lynn. Standing, l to r, are: Thomas Gillick; Socrates Vaniotis; Weldon Helmus, AATCC president; Raymond Carey; Andrew Goodwin; and Rudolph Geering

L to r: President and Mrs Weldon G Helmus; Chairman Albert H Rant; Toastmaster Geo O Linberg; Mrs J E Lynn; Mrs Raymond Carey; Past chairman J Edward Lynn; Past chairman Raymond Carey; Mrs Rudolph Geering; Past chairman Rudolph Geering

Entertainment was furnished by the Housatonic Chapter, Society for the Preservation and Encouragement of Barbershop Quartet Singing in America, Inc, Jack MacGregor, director

L to r: Albert H Rant, chairman, WNE Section; Weldon G Helmus, AATCC president; Mrs Helmus; Geo O Linberg, past president, AATCC, and toastmaster



L to r: Mrs Norman A Johnson; Norman A Johnson, editor, American Dyestuff Reporter; Harry Redstone

A solo by Chairman Rant

L to r: Mrs W H Espelin; W H Espelin, WNE secretary; Mrs Andrew Goodwin

JUNE JAMBOREE
1960

Inter Alia—Inter Nos

P J WOOD

READING

Without the slightest intention of belittling or even questioning the value of radio listening or video viewing, we wonder if these two new adjuncts to the lives of most people have not lessened the interest of the hearers and viewers in good old-fashioned reading.

In spite of the many evenings we have enjoyed in quiet conversation, in collective card playing, in ensemble music playing and singing, there still remains in our memory the recollection of some other nights spent with the rest of the family, each one comfortably ensconced in the special chair of his or her choice, reading---just reading.

Of course, the one great advantage of this form of calm collective---and yet individual---entertainment is that each one has his own particular choice of diversion, without interference of the one with the other.

No matter how heated is the political discussion, no matter how violent the action described, no matter how unruly the elements in the narration of the author, none of these is perceived but in the mind of the one reader perusing the story in which these events are taking place. It is never necessary to close the windows lest the neighbors be disturbed.

Then again, what is there to beat listening to a good reader reading?

We have a keen recollection of Mother reading out loud to us, during the one attack of mumps that we have ever experienced. And, of all books, that excruciatingly funny "Three Men in a Boat" by Jerome K Jerome. Any of you may remember having had mumps in the days of your youth? And you may be able to call to mind how painful it was to laugh when the mumps were at their lumpiest. Wow! Maybe it was the precise treatment required; we evidently recovered, for here we are.

Never to have had---or worse yet---to have lost the taste for reading is to be lamented. Ralph M Besse, who is vice president of the Cleveland Illuminating Co, writing in a recent number of the Journal of the American Association of University Women, among other things, has this to say, "Students ought to be taught the importance of a good life-long habit of good reading. A good many college graduates are never even told that this is a requisite of the educated man. Every teacher of every course should tell them - not once but often. The philosophy should become a campus tradition. It should become a kind of educational commandment. The reading habit should be known as the mark of the educated man".

Put down those racing forms, students, let's read something worthwhile.

LIBRARIES

From the subject of reading to that of libraries is only one short step---and a logical one. Not that we have spent over-much time in those useful compendia of handy information, except when we were booted in by sheer necessity.

Fact of the matter is that we have recently been blessed with another letter from F R Taylor in Manchester in which he sent us a copy of the most recent report of the Library Committee of the City of Manchester.

In his letter, Mr Taylor enclosed a copy of the latest edition of The Manchester Review, which is published quarterly by the Library Committee of the City of Manchester.

This number we found very interesting because it contained an article by Mr Taylor..."The Technical Library: its Past, Present and Future".

The article follows the growth of technical reading in that important part of the world, as shown by the borrowings of books in the Technical Library. In 1922 there were available about 35,000 volumes. In the first full year of operation we learn that 46,281 readers used 85,107 books.

Year by year there has been a steady growth in the size of the library as measured by the number of books and in the use of those books by a constantly increasing army of readers, until we find by 1957 224,994 readers were making use of 396,545 volumes. It is estimated that if the current year's use continues at the present rate of increase experienced since the report last mentioned, approximately 400,000 readers will have used over three quarters of a million volumes for reference, 35,000 volumes will have been lent for home reading, over 2,000 items lent to industrial concerns on special loan, 7,000 photocopies will have been produced, and 15,000 inquiries answered by telephone. BIG BUSINESS, indeed.

"Without the love of books" says Leon Gutterman in a recent editorial in Wisdom, "the richest man is poor; but endowed with this treasure, the poorest man is rich. He has a wealth which no power can diminish; riches which are always increasing; possessions which the more he scatters, the more they accumulate; friends who never desert him, and pleasures which never end".

UPS & DOWNS

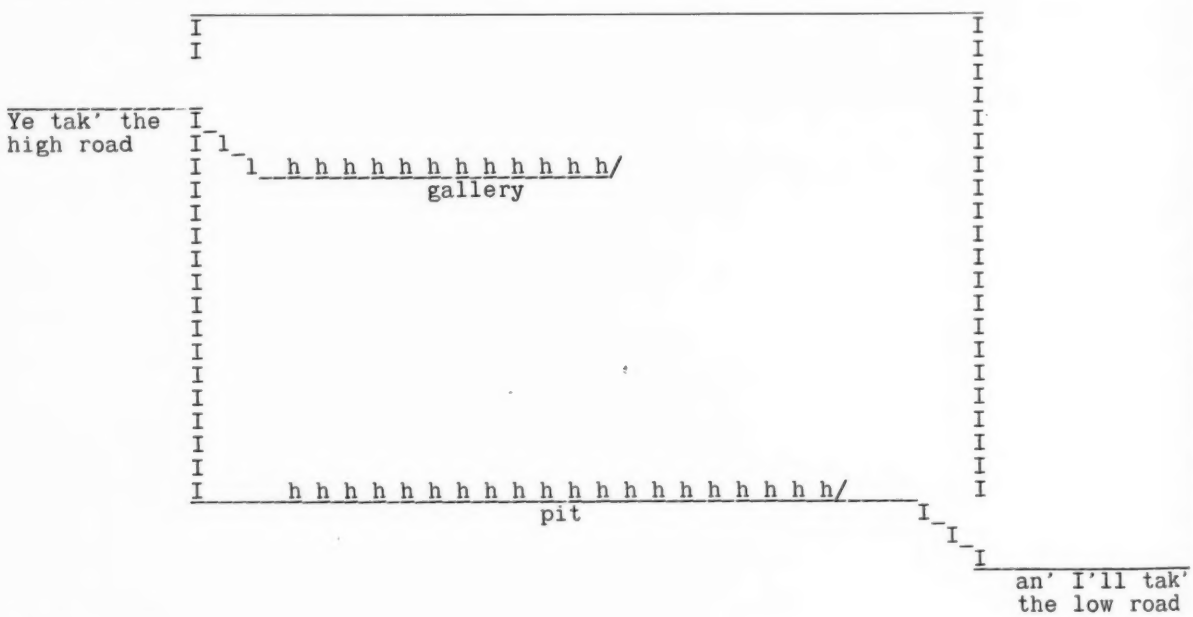
Mention of the Byrom Dyeing Company, Bacup, in the Dyer the other day reminded us of a visit we made once to the home of our class-mate George A Stansfield of Waterfoot, near Manchester, called by the natives Watterfooit, if our memory is still functioning correctly.

His father had a felt mill there. It was here that we first saw the operation of felt making---thin and thick, soft and hard. Most of the out-put of the heavier sorts was for making saddle felts for the cavalry, as we remember. At Baltic Mills, not far from there, they were still using water power to drive the mill, when we were there.

Lighter types were being used, right there in Rawtenstall, to make the felt slippers into which it is very comfortable to get, after a day spent tramping through the cold winter snow and slush normal in that part of England during most true-to-form winters.

But, to get back to Bacup. In that town there was a unique theatre. It was unique in this respect; one had to climb up a few steps to get into the lowest level ---what they call the "pit" (although the first few rows on this level were dignified by the name of the Orchestra Stalls)---and the seats on the highest level, the gallery, were reached by descending as many steps.

Mysterious? Not at all. The building was built on a hill side; the entry to the pit was on the street along the bottom of the hill, hence the steps up. The entrance to the gallery was from the road parallel to the low road, but much higher up the hill. (Elementary my dear Elmer).



SHORT SHORTS

According to C & E News, the quantity of potato chips produced in this country in 1949 was 301 million pounds. In 1959, it was 725 million pounds.

Barring an announcement by some government department that the whole potato crop was found to be poisonous, or by the AMA that potato chips are responsible for sporadic outbreaks of the "pip", this should rise easily to 1.5 billion pounds in the next ten years.

* * *

Some unknown writer deserves credit for this gem..."Criticism is something you can avoid by saying nothing, doing nothing, and being nothing".

All of which leads very naturally to the remarks of La Rochefoucauld, as follows: "Few persons have sufficient wisdom to prefer censure, which is useful to them, to praise, which deceives them".

This reminds us of an argument that Elmer had with his boon companion, Jacques (Elmer pronounces it "Jackass"). The latter was prone to overuse the word "unique" for which Elmer took him to task. In fact Elmer was impatient enough to call him a horse's neck. Said J, "Why, that's unique". "What's unique about horses' necks?" demanded Elmer. "Because, said J, "There are so many more of them than there are horses". This little everyday observation has come to be known as Hobson's phenomenon.---QEF

Abstracts

Russian and Satellite Research and Development in the Field of Synthetic Fibers

Leible, R C and Weiner, L I, *Textile Research J* 30, 239-48, April, 1960.

A delegation from the U S plastics industry and two outstanding American scientists have visited Russia recently. All agree that Soviet research is strong, reasonably well conceived, and motivated by a firm desire to accomplish useful results.

Russian scientists were found to have good equipment and to be well informed about foreign work in their respective fields. In addition to their well-known linguistic ability, they have the advantage of Government-directed abstracting and translating facilities greatly superior to anything available in the U S. The author suggests that a similar set-up may be necessary in this country if we are to follow adequately the research in Russia and other countries.

High-ranking scientists and political leaders in Russia have admitted dissatisfaction with their rate of progress in the development and production of new synthetic fibers. The best estimates place man-made fiber production years behind that of the U S.

The synthetic fibers known to be produced or studied in Communist countries at the present time are presented below.

Anil is the Russian equivalent of nylon 66. The production is relatively limited.

Kapron is nylon 6 or Perlon. A plant for its production has been constructed. East German scientists have developed Perlon fibers that are hollow and have unusual cross-sections.

Steelon is also a nylon 6, produced in Poland.

Enant is nylon 7. This is a new fiber, made from polyenanthic amide, that has not been produced in the Western world. It is said to have unusual stress-strain properties at high temperatures and resistance to u v light.

Pelargon is nylon 9. It is made from amino pelargonic acid, and is reported to possess exceptionally high resistance to multiple deformation (eg, bending).

Rilsan is an adaptation of a French nylon 11 polyamide.

Polyamides from piperazine are reported by Latvian scientists. One of these is said to have characteristics between those of nylon and Dacron.

Ftorlon is a fluorine-containing compound that has no counterpart in the U S. Its chemical identity has not been disclosed. Compared with Du Pont's Teflon (polytetrafluoroethylene) it has poorer heat stability but superior stress-strain properties and breaking tenacity.

Lavsan is apparently chemically identical with Dacron and Terylene.

Nitron, also called *Nitrolon*, is an acrylic fiber similar to Orlon and made from dimethyl formamide.

Saniv is said to be made from a 40/60 copolymer of acrylonitrile and vinylidene chloride. Russian scientists are also investigating copolymers of acrylonitrile and vinyl chloride, which would correspond to Union Carbide's Dynel.

Soviden is made from a copolymer of vinylidene chloride and vinyl chloride, and would therefore appear to resemble the American fiber Saran.

Khlorin is prepared from chlorinated polyvinyl chloride. Its nearest counterpart outside Russia would be the German Pe Ce fiber. It softens at 80-90°C.

Vinitron is made from a mixture of Khlorin and nitrocellulose. Addition of the latter raises the softening point to 150°C.

Deirin is a new high m w polymer of formaldehyde. This is probably the same chemically as Du Pont's Delrin. The latter, however, is not available in fiber form at present.

The authors point out that a possible threat from Soviet textile research lies, not in the development of slightly improved counterparts of nylon, Orlon, etc, but in the possibility of a real breakthrough, emanating from extensive work in this field, of new and unusual polymers, and leading to the development of new fibers with greatly improved heat and chemical resistance and impact properties.

Forty-four references to the literature are cited.

•

Key Controls in Shrinkproofing Wool

Anon, *Textile World* 110, 96-7, May, 1960

The most effective method of reducing the tendency of wool to shrink lies in removing the scaly surface of the fiber by oxidation with acidic solutions of chlorine. But the reaction is extremely rapid at low pH and relatively ineffective at high pH. So a buffer must be added if the desirable characteristics of the fiber are to be retained after the scaliness has been reduced.

If the chlorination is done properly, the hand, color, and dyeing properties of the fiber will be retained; but too rapid chlorination will produce a weak, harsh fiber that will not dye evenly.

There are three basic processes of chlorination that have been successful. Two of these are called dry processes. In one of them gaseous chlorine is applied to damp wool in a closed chamber. The other dry process depends on solvents that carry chlorine-bearing chemicals to the wool. This method also requires a closed system, and the solvent must be recovered.

By far the simples method is to treat the wool in ordinary dyehouse equipment with a suitably buffered solution of chlorine. Sodium hypochlorite is the usual source of chlorine for the process.

The ideal chlorinating solution must be so balanced that it does its work quickly and affects only the scaly surface of the fiber as evenly as possible. This type of reaction is brought about by adding a chlorine acceptor to the bath. The acceptor combines with the chlorine to form chloramines, which in turn decompose and release the chlorine to the wool. The reaction is thus slowed down.

Full particulars of this process are given. The sodium hypochlorite is acidified with either sulfuric or hydrochloric acid, and Chloregal D (Gy) is added as the acceptor. The temperature of the bath is 50-68°F, and the pH value at the start is 2, rising gradually to 3.

Sodium bisulfite or thiosulfate is added later as an antichlor. The wool is then washed well. If it is to be dyed, it should first be neutralized with ammonia and an addition of H_2O_2.

This method of chlorination may be applied to wool in any one of several forms from slubbing to piecegoods, including packaged yarn.

•

Cibacron Dyes in the Pad-jig Process

Anon, *Ciba Rev* #136, 47, Feb, 1960

Various observations made in the laboratory caused the authors to examine the influence which the electrolytes normally used in the fixation bath, ie, common salt or Glauber's salt, have on the yield of fixed dye, when Cibacron dyes are applied

to cotton by the pad-jig method.

A similar test was carried out once before, but no notable differences could then be observed. In the meantime, however, the method of dyeing has been modified: the goods, previously padded with the dye, are now entered at 120-140°F into a bath containing the salt but no alkali, and are given two to four ends. The alkali is then added and the bath gradually brought to the temperature prescribed for fixation.

This method of working is said to give shades which are level and free from ending, even if the goods are not given an intermediate drying. However, it was found that quite often the yield obtainable was by no means comparable to that achieved by the pad-steam or the pad-thermofix method, particularly in the case of heavy shades. This was traced to the fact that the yield obtained with a high concentration of dye depends largely on the type of salt used.

Dye tests were made on bleached mercerized sateen with 13 Cibacron dyes, each in three different concentrations, all fixed with trisodium phosphate (except the Black, which was fixed with soda ash). Added to one series was 200 gpl Glauber's salt and to the other, 200 gpl common salt.

The differences in strength of the dyeings in the two series were only slight when low concentrations of dye were used, but in the heavy shades the dyeings made with common salt were much reduced in depth, being in some cases only one-third to one-fifth as deep as those made with Glauber's salt.

For pad-jig dyeings, therefore, only Glauber's salt should be used. This does not apply to dyeings made by the exhaustion method, the authors state.

•

Paper-to-Textile Printing Process

Lowit, K, *Dyer 123*, 647-8, April 22, 1960

The author describes the "Star" printing process, the name being derived from the name of the Italian firm that developed and patented the process.

For many years textile printers have been interested in using paper-printed methods. There are certain difficulties to be overcome in order to obtain on textiles a true reproduction of an artist's drawing or a color photograph, especially when using the trichromatic method. One of the difficulties is that textiles are seldom dimensionally stable compared with paper or plastics. Another difficulty is that when printing textiles directly one cannot use as fine an engraving as on paper.

The Star process overcomes these problems by working in two phases: 1) by printing with paper printing machinery, using textile colors, on paper; 2) by transferring the whole design from the paper to cloth.

The artist's drawing or color photograph is first separated by photographic methods into three primary colors plus black. These colors are then engraved on rollers or plates, with the help of grids or photoscreens having 150 lines per inch. The depth of the engraving is much more shallow than engravings on textile print rolls. Printing is done on specially prepared paper, using a four-color printing machine (or in some cases copper plates).

Most textile printing dyes can be used, with the exception of dyes produced on the fiber (eg, oxidation blacks and naphthols), but they must be carefully selected to give a good trichromate effect. The dyes are dispersed and mixed with a temporary binder which serves also as a carrier, and which dissolves in certain organic solvents. In other words, the dye is applied in the form of a printing ink.

The transfer from paper to cloth is done by letting the paper and the cloth go together through a calender at controlled temperature and pressure. When paper and cloth emerge from the nip they are separated, and the cloth is processed in accordance with the dyes used.

While smooth-surfaced fabrics give the best results, it is possible to use textured cloth and still not lose detail because of the high pressure in transferring from paper to textile.

Simultaneous Dyeing and Resin Finishing

ICI Dyestuffs Div, *Dyer 123*, 495, Mar 25, 1960

The authors state that it is now possible to resin-finish cloth at the same time that it is dyed, by means of the "Procion-Resin" method. In this new process, the Procion reactive dyes are applied in conjunction with commercially available resin precondensates, producing dyeings that are said to be superior in fixation and color value to dyeings obtained by any established techniques. The dyed fabric at the same time acquires all the benefits normally associated with a resin finish, in particular, improved crease-recovery properties.

Separate dyeing operations are completely eliminated, since the Procion-Resin process follows the sequence of a normal resin finishing treament, ie, pad, dry, bake and wash off. The essential difference is in the addition to the pad liquor of the dissolved Procion dye and a special Procion-Resin Catalyst A. The processing technique is the same as in conventional resin finishing. An adequate temperature must be maintained at the baking stage.

The final washing-off of unfixed dye is made easier by the new process because of the greatly improved fixation. It is stated that the dyestuff cost is reduced, especially in the case of deep shades.

The principle behind this process is as follows. Procion dyes react with cellulose under alkaline conditions, this being the principle of their application to cotton and rayon. Under acid conditions they will react with polymers containing basic groups; this forms the basis of their application to wool and nylon. They will also react under acid conditions with nitrogen resin precondensates, giving a stable chemical linkage.

The new process has been exhaustively tested in the laboratory, and the results have been confirmed in large-scale trials, it is stated.

Several well-known resin finishes are recommended to be used in this process. Precise details are not given, but may be obtained from the manufacturers.

General Calendar

AMERICAN COTTON MANUFACTURERS INSTITUTE
Mar 23-25 (12th Annual Meeting, Fontainebleau Hotel, Miami Beach, Fla)

CANADIAN TEXTILE CONFERENCE
Feb 7-9 (Queen Elizabeth Hotel, Montreal, Quebec, Canada)

CHEMICAL EXPOSITION USA
Sept 13-15 (Statler Hilton Hotel, New York, NY)

INSTRUMENT SOCIETY OF AMERICA
Sept 26-30 (Annual Meeting, Instrument-Automation Conference and Exhibit, New York, NY)

INTERNATIONAL TEXTILE MACHINERY EXPOSITION
1962 (3rd Exposition, Hanover, Germany)

NATIONAL COTTON COUNCIL
Sept 28-29 (9th Chemical Finishing Conference, Statler Hotel, Washington, DC)

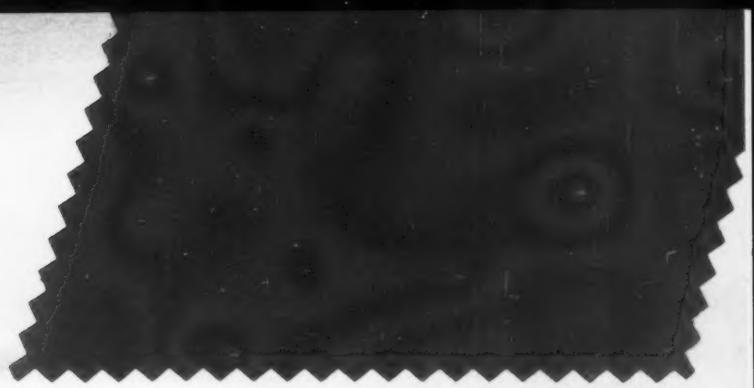
SOUTHERN TEXTILE EXPOSITION
Oct 3-7 (Greenville, SC)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION
Sept 13, Oct 11, Dec 8 (Hotel Roosevelt, New York, NY)

TEXTILE TECHNICAL FEDERATION OF CANADA
Sept 7-8 (Seventh Canadian Textile Seminar, Queen's Univ, Kingston, Ont, Canada)

TEXTILE OPERATING EXECUTIVES OF GEORGIA
Oct 22 (Harrison Hightower Bldg, Georgia Inst of Technology, Atlanta, Ga)

WORLD CONGRESS FOR MAN-MADE FIBERS
May 15-18, 1962 (2nd World Congress, London, England)



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A new series of neutral premetallized dyes for wool, nylon, zefran, acrilan, creslan . . . has an extremely high degree of light fastness, particularly on polyamide fibres, together with good fastness to washing, cross dyeing, carbonizing, peroxide and chlorine. Lanafast dyes give a cleanness and freedom from stain on vegetable fibres when used on wool blends. You get better results at lower cost. Dependable working properties and consistent shades are assured by the Althouse multi-check system of quality control.

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News of the Trade

ATME-I Huge Success

The American Textile Machinery Exhibition—International closed last month in Atlantic City, NJ, with exhibitors and visitors acclaiming it the best U S show of its kind.

With a total registration by visitors of just under 17,000, the Exhibition, it was generally agreed, drew an impressive turnout of top U S and foreign mill representatives.

According to William K Child, president of ATMA, sponsor of the Exhibition, registration was about 75% American and 25% foreign. Textile personnel from 39 foreign countries registered for the show.

The companies which "pay the bill", the exhibitors themselves, have been unusually complimentary in their appraisal of the Exhibition, and many commented that it was unprecedented insofar as actual selling or generating sales interest.

Many visitors agreed that the combination of new equipment and the international flavor of the Exhibition were responsible for the huge turnout.

Exhibitors of wet-processing equipment, both domestic and foreign, appear to be unanimous in their praise.

Typical of the exhibitors displaying overseas equipment were Regent Machinery Corp, Societe Alsacienne de Constructions Mecaniques, Svetema, and Textilmaschinen Eduard Kuesters Krefeld.

Leonard Platnick, president of Regent Machinery Corp, New York, reported numerous direct sales orders for the Omez forced jet washing machine, which the firm exhibited.

Traffic was heavy to view SACM's automatic screen printing carriage for existing tables, Svetema's laboratory dyeing and bleaching equipment and open-width washer, and Kuesters' Aquaroll water mangle and Vibrotex continuous backgrey washer.

Domestic machinery and equipment manufacturers were equally enthusiastic.

Stanley Brooks, vice president and sales manager at H W Butterworth and Sons Co, stated that the show was far superior to any previous show in his experience, and a lot of perspective orders had been cultivated by his firm. Butterworth's Emco rotary cutter winder got the most attention at this exhibit.

James H Hunter, president of James Hunter Machine Co, stated that "every piece of equipment we've exhibited is selling". "We're getting real interest, not curiosity; results are far superior to any we've ever had at an exhibition", he stated. The potential inherent in Hunter's pressure-seal machine was a center of a large amount of interest.

The Governor of North Carolina and Mrs Hodges are welcomed to Atlantic City by Governor Meyner of New Jersey, and by Mildred Andrews and John H Bolton Jr, of the American Textile Machinery Association, sponsors of the show. Governor Hodges made the principal address.

W K Wyatt, vice president of Turbo Machine Co, commented on a "new atmosphere in the textile business", citing renewed interest on the part of plant managers in control equipment". Chief interest at Turbo's exhibit was centered about its new recirculating-type extractor-dryer.

Gaston County Dyeing Machine Co reported highest interest in its recirculating extractor and static pressure rapid driers, while Birch Brothers, Inc was enthusiastic in visitor's response to its Minicalender laboratory calender.

Ralph C Parkes, president of National Drying Machinery Co, reported "good bookings" for its drying equipment and expects to be ahead this year.

Marshall and Williams Corp handled a heavy flow of visitors to view the lightest and heaviest tenter frames in its line, while Robert Bell, sales manager at Klauder Weldon Giles Co, expressed pleasure at the interest in the firm's skein-dyeing equipment.

Riggs & Lombard Co's dispaly of a new revolving vibrator operating at 3600 cycles a minute attracted numerous visitors as did Morrison Machine Co's new, small Williams Unit combined with a high level pad.

Biggest setup at the Exhibition was the Artos Maschinenbau two-deck finishing range, which measures over 54 feet in length, at Proctor & Schwartz Inc's exhibit.

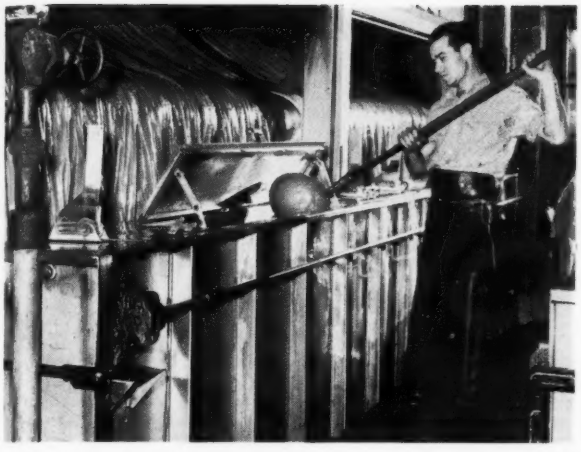
Traffic at the respective exhibits of Taylor Instrument Companies, The Foxboro Co, and Scott Testers Co, attested to extensive interest in the latest in instrumentation and testing equipment.

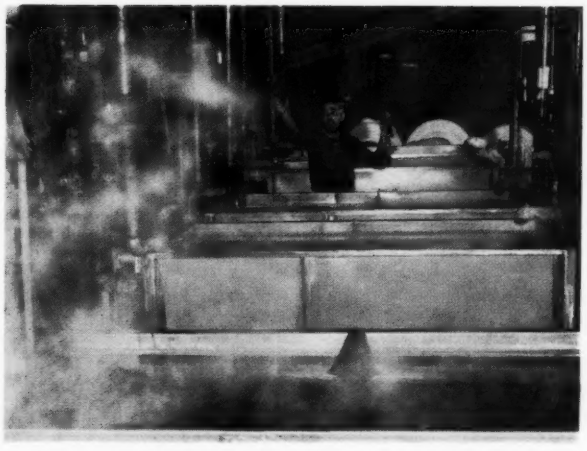
While complimenting ATMA on programming such a well-organized, concentrated Exhibition, some exhibitors expressed the opinion that in an exhibition of this magnitude it might be well in the future to spread it over two five-day weeks.

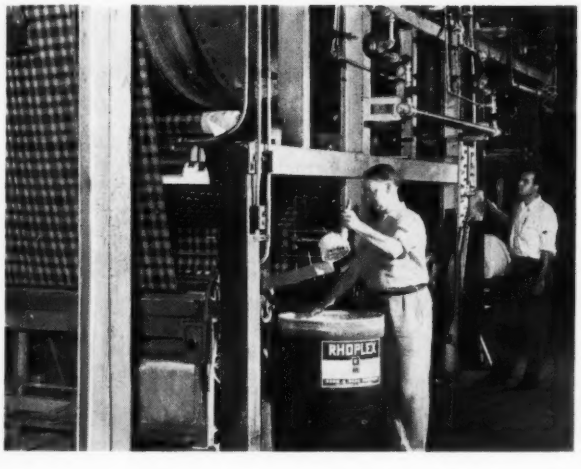
"We constantly had twenty and thirty prime customers and potential customers in our booth at the same time," one exhibitor said. "It's impossible under those circumstances to give each one the attention and courtesy they want and deserve.

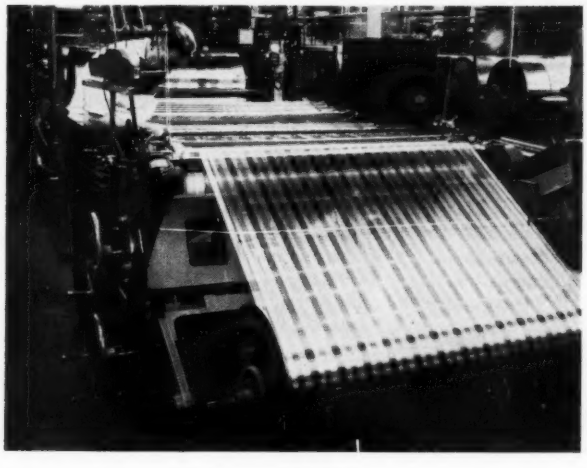
"If we'd had ten days spread over two weeks, we could have had more time to do a proper job. It would cost more, but in my opinion it would be worth it."

"We are deeply gratified by the magnificent response the textile industry gave this Exhibition," said John H Bolton Jr, chairman of the ATMA Exhibition Committee.









FROM STARCH TO FINISH

...Rohm & Haas textile chemicals

There's a work-saving, efficiency-boosting Rohm & Haas product for virtually every step in textile processing and finishing . . . and in many cases, a number of these superior products *work together* to save time and cut processing costs.

Some examples: ACRYSOL water soluble warp sizes and thickeners; RHOZYME enzyme desizing materials, for speedy removal of starch and proteinaceous sizes; TRITON surfactants and detergents with great emulsifying and wetting power, for fast wetting, thorough detergency and a clean rinse in many different wet processing applications.

Dyeing is more efficient, more uniform with TAMOL dispersing agents, LYKOPON reducing agents, and TRITON dyeing assistants. Printing results get a boost from FORMOPON printing hydro and RHONITE or RHOPLEX pigment binding resins.

Where stripping is necessary, PROTOLIN stripping agents offer powerful color removal over a range of pH. RHOPLEX acrylic emulsions are widely used as backing for upholstery fabrics and binder for non-woven fabrics. RHONITE thermosetting resins impart the popular "wash-wear" finishes.

Along with this complete line of textile chemicals, Rohm & Haas offers complete technical service by a staff of experienced technicians second to none in textile knowhow.

To get more information on the complete line of Rohm & Haas textile chemicals and services write for the new free booklet, Chemicals for the Textile Industry.

Chemicals for Industry

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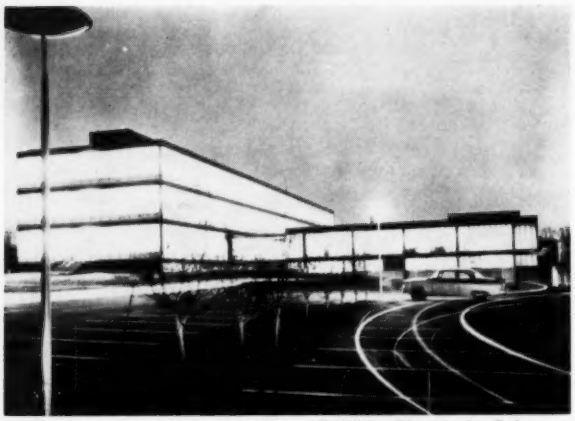
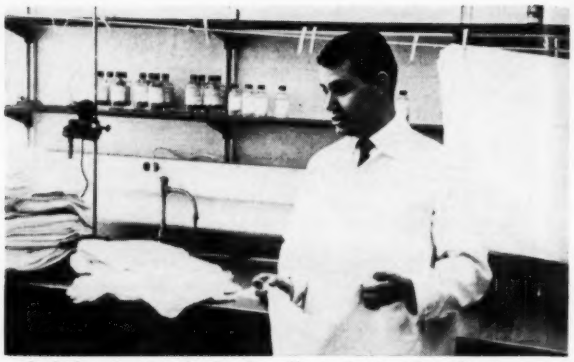


Time-exposure photo of Union Carbide Chemicals Co's new Technical Service Laboratory near Tarrytown, NY



Carbide scientist checks the effect of a textile softening agent on towels at the Company's new Technical Service Lab, where work is conducted to improve the applications of the Company's line of chemicals to clean, finish, dye and process all types of textiles.

Union Carbide Chemicals Company Opens Technical Service Laboratory

Union Carbide Chemicals Company is now operating its new Technical Service Laboratory in Tarrytown, NY. The new Laboratory is designed to aid in the development and improvement of the products of Carbide's customers.

This new facility centralizes and expands Carbide's customer service and use-research that, since 1925, had been carried out principally at Mellon Institute in Pittsburgh but also in several other areas including South Charleston, W Va; Whiting, Ind; and affiliated company laboratories at Bound Brook NJ; Tonawanda NY; and Millwood, NY.

"An increased service effort is required to support sales of chemicals in areas undergoing rapid or significant changes," J A Field, vice president—marketing, told guests at the opening of the Laboratory May 12. "Customers are wary of changing their formulations, more so than several years ago, and as suppliers, we must be responsive to the needs of our customers. These needs may be defined only by offering complete test data and service backup. Our use-research programs are creative, and as such, are designed to expand and diversify the use of chemicals."

The scope of activities in this modern facility is broad and varied to provide the information needed for the company's more than 400 synthetic organic chemicals and the many end uses into which they go. Typical of the 29 major industry groups in which work is underway at the Laboratory are: textiles, automotive, petroleum, polyether foams, aerosol propellents, refrigerants, plasticizers, water-soluble chemicals, detergents and household products, gas purification, and surface coatings.

The Laboratory building accommodates about 100 scientists with a supporting and administrative staff of 50 people under the direction of A B Steele. The main portion is a three-story stainless steel and glass building. It is 300 feet long and 60 feet wide. About one-third of the building is devoted to administrative offices and public areas. The remainder is divided into 46 laboratories with 33 adjacent offices.

A Mechanical Test Building is connected to the main Laboratory. The test building contains a two-story test area overlooked by a mezzanine office area. Mechanical experimental activities that require large equipment are conducted in the high-ceilinged test area.

The Technical Service Laboratory and Mechanical Test Building are designed to be flexible in their experimental activities to keep pace with changing technology and customer requirements. They are equipped with the latest in analytical and evaluation equipment to investigate chemical products used in all chemical process industries.

•

Baird-Atomic to Handle Hilger & Watts Equipment in US

Baird-Atomic, Inc, and Hilger & Watts, Inc, of Chicago, have jointly announced a U S sales and service agreement with Hilger & Watts Ltd, of London, England, leading manufacturer of scientific and engineering instrumentation.

Under the arrangement, Baird-Atomic will sell, install, and service certain Hilger & Watts units which complement its own line.

Initial emphasis will be on the English firm's vacuum spectrometers.

Hooker to Manufacture Sodium Hexametaphosphate

Construction of facilities to manufacture sodium hexametaphosphate will be undertaken almost immediately by the Phosphorus Division of Hooker Chemical Corp. The installation, expected to be completed by December, 1960, will be located at Jeffersonville, Ind, headquarters for the Division's four plants.

The company has maintained warehouse stocks of sodium hexametaphosphate at the Division's Jeffersonville, Adams, Mass, and Dallas, Texas, plants for a number of years. Production of this chemical will now increase the company's diversification of manufactured products for established markets.

Construction of the hexametaphosphate facilities will proceed simultaneously with another plant now being built at Jeffersonville for the manufacture of tetrapotassium pyrophosphate, to be completed in the fall.

Elemental phosphorous, the key raw material, is manufactured by Hooker at Columbia, Tenn, and Niagara Falls, NY, as the basic chemical for its line of phosphorous compounds. Hooker announced in March that it will increase phosphorous capacity by building a third phosphorous furnace at Columbia.

•

New Source of Sodium Dispersions

Acton Laboratories, 1180 Raymond Blvd, Newark 2, NJ, is offering sodium dispersions as two standard products—sodium napthalene dispersion, crushed solids, and 50% sodium in mineral oil. Orders for single-pound lots are accepted.

Pick a Petal for Profit!

Lanolized®
. . . the "skin-compatible" finish for all fabrics that require maximum against-the-skin comfort!
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. . . resin finishes for enhanced wrinkle and abrasion resistance, and stability.
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PTI Confers 81 Degrees

Eighty-one students from the United States and abroad were awarded degrees at the 76th Commencement Exercises of the Philadelphia Textile Institute held Saturday, June 4.

The principal speaker at the exercises was Michael Daroff, president, H Daroff and Sons, Inc, who was also conferred with the honorary degree, Doctor of Textiles, by Bertrand W Hayward, PTI president. Daroff was presented by W Lyle Holmes Jr, president, Archibald Holmes & Sons, and chairman of the PTI board of trustees.

In addition, Dr Hayward conferred the honorary degree, Doctor of Textile Science, upon Prof Thomas Edman, Head, Knitting Department, PTI. Edman was presented by Ingram Bergman, president, Bergman Knitting Mills.

William R Hockenberry, director, Evening and Extension Schools, Univ of Pennsylvania, was the recipient of the honorary degree of Doctor of Laws. He was presented by Edward B Shils, executive secretary, Knitted Outerwear Manufacturers Association, Philadelphia district.

Also recipient of the honorary degree Doctor of Laws was Merwin R Haskel, president, United Merchants and Manufacturers, Inc. Haskel was presented by Harry Riemer, consultant, Henry Bach Associates, Inc.

A Ward France, Dean of Faculty, Philadelphia Textile Institute, presented the candidates for graduation and the degrees were conferred by President Hayward.

Donald B Partridge, Dean of Students, Philadelphia Textile Institute, awarded the several prizes to members of the graduating class who had distinguished themselves throughout their college careers by their scholastic achievement, leadership in student affairs, participation in extracurricular activities and good school citizenship.

American Association of Textile Chemists and Colorists prize for the senior student who had shown the greatest proficiency in chemistry, printing and dyeing in his senior year went to Vinodchandra Mody of Bombay, India.

Other winners were William Austin, AATT Plaque Award; Gordon Bronstein, Textile Veterans Association Honor Medallion; Richard Kaufman, Alfred Bloom and Gerald Goldman, fraternity prizes.

Mrs George Cavendish, granddaughter of Sara Tyler Wister, presented the Sara Tyler Wister awards for students with the highest academic standing for the full length of their respective courses: *Chemistry and Dyeing*—Jonathan Rivlin, 1st; John Klocko, 2nd; *Textile Engineering*—William Austin 1st; Gordon Bronstein, 2nd; *Management and Marketing* — William Dwyer and Henry Wollering, tie for 1st; Andrew Beck 2nd.

Those receiving the degree of Bachelor of Science in Chemistry and Dyeing included Rafael Akyuz, Sidney L Barkoff, John J Klocko, James C Lang, Ives P LeBrun, Joseph B Li, Vinodchandra Mody, Anil C Nanavati, Jonathan Rivlin, Leonard Rudolph, and Daniel A Simanaitis.

•

LTI Confers 143 Degrees

One hundred forty-three degrees were conferred at the 62nd commencement exercises of the Lowell Technological Institute on June 5, including 11 master of science and 132 bachelor of science degrees. Five honorary Sc D degrees were awarded, to Earl P Stevenson, chairman of the board, Arthur D Little, Inc, commencement speaker; Rev Daniel Linehan, SJ, director of Weston Observatory; Jonathan Karas, science director of WBZ-TV; Joe V Meigs of Boston; and Francis W Gainey of Lawrence.

Mr Gainey, alumnus and trustee of the Institute, has had extensive industrial experience at Pacific Mills, Dominion Textile Co and Cheney Bros Silk Mills, both in technical and administrative capacities, and has also been connected with E I duPont de Nemours & Co, Inc and Allied Chemical Corp on research problems concerning the application of color to textiles.

Prof James W Bell, placement director, announced that 83% of the class received their commitments as a direct result of the campus recruiting program. Of the class of 1960, 75% will go into industry, 8% to graduate school and 13% to military service while 4% did not indicate their plans.

Overall average starting salary of the class is $6226 per year. This figure, explains Professor Bell, includes students entering the teaching profession and government services in GS-5 and GS-7 positions. The lowest salary accepted was $4200 by a student entering the teaching field, and the highest salary accepted was $8,000 for a graduate of the general engineering program who will work for a synthetic textiles firm.

The geographical distribution of those entering industry is as follows: Massachusetts, 47%; other New England states, 14%; mid-Atlantic area, 26%; West, 1%; Midwest, 5%; South, 6%; and foreign, 1%.

Graduate students were not registered with the placement office. MS degrees in the area of textiles were awarded to Muriel Angelil, Ronald S Perry, and Thomas F Saunders, in textile chemistry, and to John W Kimman Jr, Edmund Pua, and Gungor Solmaz, in textile engineering.

John J Santos, who received a BS degree in textile chemistry, will do graduate work at the Univ of New Hampshire.

•

New Cyanamid Facility Playing Important Role in Marketing of Creslan

American Cyanamid Co's Fibers Division applications research and technical service center at the company's Bound Brook, NJ, plant is playing an important role in Cyanamid's long-range marketing program for its Creslan acrylic fiber.

The new center provides processing equipment for dyeing and finishing, and for yarn and fabric applications programs. It also includes laboratories for dyeing, shade matching, fastness testing and physical testing, as well as offices and other facilities for dyeing and finishing field technical service personnel.

The new installation is located in Building 103 at the Bound Brook Plant. In addition to providing important new applications and dyeing facilities, the unit consolidates previously existing dye laboratories and technical service operations maintained by Fibers Division at the plant.

Of particular value to the marketing effort for Creslan is the addition of processing equipment for knitting and dyeing. A variety of equipment permits both circular and flat knitting operations in connection with applications programs for Creslan. Dyeing facilities include small-scale prototype equipment for stock, package and skein dyeings, as well as for sweater, hosiery and piece dyeing.

Addition of the Bound Brook installation is said to provide the division with better-balanced facilities for research and development, technical service and applications operations. The division maintains basic fiber research facilities at Cyanamid's Stamford, Conn, Research Laboratories. It conducts product and process improvement and quality control activities in laboratories at its Santa Rosa Plant near Pensacola, Fla. an acrylic fiber plant.

The wide range of properties now available in Eastman's Epolene series provides greater flexibility in formulating polyethylene emulsions for softening "wash and wear" cottons and synthetics, and for textile lubricants and sizes.

Permanent, low in color, non-chlorine retentive and easy to prepare, emulsions based on Epolene polyethylene give you a practical and economical method for improving the hand, abrasion resistance and tear resistance of "wash and wear" treated fabrics.

With Epolene, you can prepare any kind of emulsion system, cationic, anionic or non-ionic, with solids contents of up to 40%.

Choose from three different low-molecular-weight resins to obtain the right emulsion properties and finishing characteristics for your equipment and service.

Epolene E is the highest-molecular-weight resin of the three. It produces stable, low-color emulsion systems of superior quality for use in softening cottons or synthetics, or as a lubricant to reduce needle-cutting and increase sewability. Like other Epolene resins, it needs no curing, lasts through repeated launderings and resists dirt pick-up and redeposition.

Epolene LVE, a new resin type, has a lower melt viscosity than has Epolene E, thus offering somewhat better handling characteristics. Epolene LVE is softer than other resins in the series. The stability of its emulsions in the presence of resin catalysts is outstanding, especially at the low end of the pH scale, as indicated by its relatively high HLB factor.

Epolene HDE is the first high-density, emulsifiable low-molecular-weight polyethylene on the market. Because it is much harder, it improves significantly the abrasion resistance and tear resistance in cotton and cotton blends. Its stability and permanence are excellent. It, too, offers easier handling characteristics during emulsion preparation because of its low melt viscosity.

If you are formulating polyethylene softeners and would like to produce stable, economical emulsion systems of superior all-'round characteristics, look to Epolene from Eastman. Let us introduce you, also, to new time-saving and cost-cutting emulsifying techniques developed at our textile laboratories. For more information on the formulating and performance advantages of these superior polyethylene resins or for specific formulating assistance, write your nearest Eastman office. We invite your inquiry.

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; Atlanta; Chicago; Cincinnati; Cleveland; Detroit; Framingham, Massachusetts; Greensboro, North Carolina; Houston; New York; Philadelphia; St. Louis. **West Coast: Wilson and Geo. Meyer & Company,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

Eastman

now offers textile finishers 3 basic types of polyethylene

New EPOLENE resins enable textile chemists to formulate broader range of softeners

Property	Epolene E	Epolene LVE	Epolene HDE
Molecular Weight	2500	1500	1500
Density	0.938	0.939	0.956
Ring and Ball Softening Point, °C. (ASTM D-36-26)	104-108	104-105	110-111
Penetration Hardness (100 g./5 sec./77°F., tenths of mm.)	2	5	1
Color (liquid), Gardner scale, max.	2	2	2
Brookfield Viscosity (cps. @ 120°C.)	1500	400	455

Epolene

EASTMAN low-molecular-weight polyethylene resins

Kelco East Coast Divisions in New Quarters

The Kelco Co, reportedly the world's largest producer of algin products, recently moved its general sales office, Eastern, Paper and Export Divisions, and its East Coast Laboratories into a modern one-sory brick building in Clark, NJ.

Continually increasing applications of versatile algin are said to be responsible for the fast growth of this 30-year old company. Algin is a colloidal polysacchride extracted from giant kelp. It is widely used as a stabilizing, emulsifying, suspending, thickening and gelling agent.

Kelco's East Coast Laboratories function as a practical arm of the three-year old $500,000 West Coast Research Laboratories in San Diego, Calif.

Kelco Co Central Division headquarters are in Chicago, Ill, and its Western Division headquarters are in Los Angeles, Calif. The new, completely air-conditioned facilities on Terminal Avenue in Clark are just off the Garden State Parkway within easy reach of New York.

•

Merkalon Plant on Stream in Italy

Montecatini's 12,000,000 - lb - per - year-capacity commercial plant for the production of Merkalon isotactic polypropylene staple fiber went on stream at Terni, Italy, in April.

The plant, the first fully commercial polypropylene textile plant of its kind in the world, reportedly will produce low-cost isotactic polypropylene staple fibers for use pure and in blends with wool, cotton, and rayon for a great variety of finished fabrics, including knitwear, blankets, draperies, upholstery fabrics, carpets and rugs, men's and women's suitings, work clothes, undergarments and the like.

The new polyproylene fiber is at present being produced melt-dyed in a series of light colors. Soon, it is claimed, Merkalon will be supplied in a form directly dyeable by the conventional and inexpensive dyeing processes employed for natural fibers.

According to Montecatini officials, worldwide interest in polypropylene fibers is so great that they fully expect to boost the Terni plant's annual capacity to more than 60 million pounds per year by 1962. Additional Merkalon capacity is expected to be made available abroad, Montecatini spokesman stated.

Montecatini's representative in the United States is Chemore Corp, 2 Broadway, New York, NY.

Stowe-Woodward's roll-covering plant at Neenah, Wis, during an earlier stage of construction

Wisconsin Roll-covering Plant Nears Completion

A new plant facility for the rubber covering of rolls is scheduled for completion next month at Neenah, Wis, for Stowe-Woodward, Inc. Rolls covered in the new plant will be used in the textile, paper and other industries.

Included in orders placed for equipping the new plant is what reportedly wil be the world's largest two-wheel grinder for the surfacing of rolls. Fitted with two grinding wheels, the machine will grind rolls up to 63 inches in diameter and up to 380" face, it is stated. The Stowe-Woodward, Inc plant will contain complete facilities for the covering of suction rolls, rectifier rolls, and the firm's Densite roll, which is plastic-covered to resist both heat and acid.

•

Century Joins MCA

Century Chemical Corp, New York, NY, has joined the Manufacturing Chemists' Association.

Principal products produced by Century include dyestuffs, pigments, organic intermediate chemicals, fine chemicals, chemocides, pharmaceuticals and asphalt products.

•

Organosilicon Chemistry Award Established

The establishment of an annual F S Kipping Award in Organosilicon Chemistry under the auspices of the American Chemical Society was announced in April by Dow Corning Corp, the sponsor, and by the board of directors of the American Chemical Society. One thousand dollars will be given to a scientist for distinguished contribution to knowledge of organosilicon compounds. The selection will be made by a committee of the American Chemical Society and will be open to scientists engaged in noncommercial research anywhere in the world.

Professor Frederic Stanley Kipping of Nottingham University, England, published 119 papers on organosilicon chemistry during the thirty-seven years, 1899-1936, that he worked in the field.

Production of Fortrel to Begin

The trademark Fortrel has been chosen for the polyester fiber to be produced by Fiber Industries, Inc, and marketed by Celanese Fibers Co.

It is expected that apparel made of Fortrel yarns will be on the market for the first time in the spring of 1961. The fiber is expected to find applications in fabrics for men's, women's and children's apparel, and also in industrial uses.

Fortrel replaces the name Teron, which had been tentatively selected earlier, after consumer surveys indicated a more favorable reaction to Fortrel.

The Fiber Industries plant at Shelby, NC, will be brought into prodction in stages, with the first unit, which will produce staple, scheduled to begin operations this month. Fiber Industries, Inc, is jointly owned by Celanese Corp of America and Imperial Chemical Industries Ltd of Great Britain.

•

Design Registration and Trade Mark Bureaus at TDI Quarters

The Design Registration Bureau and the Trade Mark Bureau, two textile industry service bureaus which were transferred on January 1 from ACMI to the Textile Distributors Institute, Inc as part of the latter's expansion program, are now located at TDI headquarters at 469 Seventh Ave, New York 18, NY.

The Bureaus are operating under the supervision of Hilda Wiedenfeld, executive director of TDI.

•

Egan Co to Double Plant Facilities

Frank W Egan Co, Somerville, NJ, manufacturers of machinery and equipment for the textile finishing industry, has announced plans to more than double its principal plant facilities. An additional 38,000 square feet of working space will be added to the 30,000-square-foot building. Construction began this past Spring. September is the target month for completion.

Construction to Start on Dreyfus Lab

Construction of The Camille Dreyfus Laboratory at North Carolina's new Research Triangle is due to be started in mid-summer.

The 20,000 square foot building, to be located on the campus of the Research Triangle Institute, will be named in memory of Camille Dreyfus, founder and first president of Celanese Corp of America. In addition to offices and laboratories for polymer research, the building will have a 200-seat auditorium for scientific meetings. It is estimated that construction will be completed in October 1961.

Funds for the laboratory were included in a $2,500,000 grant made by The Camille and Henry Dreyfus Foundation in October of last year. The grant also provides support for a major program of fundamental research in the field of polymers.

The Dreyfus Laboratory will be owned by The Research Triangle Institute, and operated as an integral part of the Institute's research activities. It will be the second building to be constructed on the 200-acre RTI campus.

•

Mendell Co Representing Algea Produkter in US

Algea Produkter, A/S Kristiansund, Norway, recently announced the appointment of Edward Mendell Co, Inc, Yonkers, NY, as its sole import representatives and sales agents in the United States for Carrageen products and other Irish moss extractives. This important additional line allows the Mendell company to offer its customers a complete series of algae and moss extracts for use in printing, dyeing, sizing, and finishing.

A range of sodium alginate products is available from Mendell's warehouses through its exclusive sales representation of Société Nourylande, Compiègne, France.

•

Staley's Handling Seqlene Sequestrants

The A E Staley Manufacturing Co recently concluded a contract distributorship agreement with Pfanstiehl Laboratories, Inc, Waukegan, Ill, for marketing Seqlene requestrants. These products are sodium salts of closely related sugar acids.

Arrangements have been made by the Staley Company to market the products on a nationwide scale to industries for use in controlling trace metal impurities.

Another Canadian Textile Conference Planned

Plans are being made to stage another Canadian Textile Conference, following the outstanding success of the 1958 event. It will be held at the Queen Elizabeth Hotel, Montreal, Quebec, February 7-9, 1961.

Executives of the Textile Technical Federation of Canada and the Primary Textiles Institute have endorsed the Conference, which is intended to include participation by all parts of the industry.

The 1958 event attracted 1,400 registrants, plus customer, consumer and government representatives, for three days of discussion and product displays.

•

Cyanamid to Manufacture Melamine in England

Plans for construction in England of a plant to manufacture melamine, were announced recently.

The new manufacturing facility will be located on land adjacent to Cyanamid's present pharmaceutical plant at Gosport, England. As with the pharmaceutical plant, the new melamine unit will be operated by Cyanamid of Great Britain Limited, a wholly owned subsidiary.

The 3,000 square-foot building housing the melamine equipment will have a capacity of 6,000,000 pounds of melamine a year and is scheduled for completion by early next year.

•

Dow Corning Forms Two Subsidiaries Abroad

Dow Corning Corp, of Midland, Mich, has formed two overseas subsidiaries, Dow Corning AG, of Basel, Switzerland, and Dow Corning International SA, of Panama.

Dow Corning AG finances and manages certain overseas interests of Dow Corning Corp but will not engage in manufacturing operations in Switzerland.

Board members of Dow Corning AG are: Charles D LaFollette, treasurer of Dow Corning Corp; Shailer L Bass, vice president of Dow Corning Corp; Alfred E Sarasin, partner of the banking firm of A Sarasin et Cie, Basel; W R Staehelin of Zurich; and Hans B Baur of Basel.

Dow Corning International SA handles the overseas sales and service of the silicone products of Dow Corning Corp, with an office at Zurich, Switzerland. Officers are Ira W Hutchinson, president; Robert R Peele, treasurer; and William C Blackburn, secretary, all of Midland, Mich.

German Licensee for Solitone

Solitone Laboratories, Teaneck, NJ, earlier this year granted a Solitone license to Solitone, GmbH, Stuttgart, Germany for the manufacture and distribution of Solitone water-phase textile colors in Germany, Austria and Switzerland.

Solitone colors are pigmented oil-in-water emulsions, used in South America, Europe and the Far East for textile printing and dyeing. They are said to provide the unusual wet abrasion resistance demanded by consumers in these markets, where severe hand-laundering resistance is still the criterion for washfastness.

•

New Borden's Resins Plant Completed

The resins plant, the first phase of a planned 90-million-pound-per-year resins and formaldehyde plant in Fremont, Calif, has been completed by The Borden Chemical Co. The formaldehyde plant is scheduled for completion in the fall.

The new Borden property, a total of 26.8 acres, is Borden Chemical's fifth on the West Coast. Others are located at Seattle and Kent, Wash; Springfield, Ore; and Compton, Calif.

•

ISA Fall Instrument-Automation Conference & Exhibit

Arrangements are being completed for one of the largest internationally recognized scientific and industrial events of 1960—the Fall Instrument-Automation Conference and Exhibit of the Instrument Society of America, together with the Society's 15th Annual Meeting. It will be held in New York during the week Sept 26 through 30.

Nearly 30,000 people, including scientists from the Americas and from Europe, are expected in attendance. Close to 400 leading instrument manufacturers will display and demonstrate the newest in scientific equipment at the New York Coliseum. Over 50 technical sessions at the Conference have been scheduled for presentation of almost 200 informative papers and discussions on the latest instrumentation developments and concepts used in most industries and processes.

Theme of the Conference and Exhibit, which will occupy all four floors of the Coliseum, is "Progress Through Instrumentation." Papers and discussions at the Conference sessions will cover a complete range of industrial instrumentation.

• NAMES IN THE NEWS •

McLaughlin

Appointment of *Philip H McLaughlin* as general sales manager has been announced by Century Chemical Corp.

In this position, newly created by Century Chemical because of its rapidly expanding sales operations both here and abroad, Mr McLaughlin will be responsible for all phases of the company's sales and marketing activities including planning, organization and coordination.

Mr McLaughlin brings to his new position extensive experience in sales planning, distribution and market analysis in both domestic and foreign markets. Before joining Century, he was manager of the Sales Department and the Technical Service Department of Stauffer Chemical Co.

•

William D Appel, editor of the *AATCC Technical Manual*, received an honorary D Sc degree from North Carolina State College at recent commencement exercises. He was presented by *Prof B L Whittier* of the N C State College School of Textiles.

•

Patrick J Kennedy recently completed 40 years of service with E I duPont de Nemours & Co, Inc. He started in the dye manufacturing division of the company at the Chambers Works and progressed through various training programs.

In 1926 he joined the sales force and is presently a sales representative in the New York office.

Mr Kennedy has been especially active in the affairs of the AATCC, both in the Metropolitan Section and the national organization. He has served as secretary, chairman, and councilor of the Metropolitan Section, chairman of the national Intersectional Contest Committee, secretary of the national Convention Committee, general chairman of the 1940 Convention Committee, and chairman of reservations and registrations of the Perkin Centennial Committee.

Atwood

Barton

Virginia Smelting Co, West Norfolk, Va, recently announced the appointment of *Harold S Atwood* to manager and *Robert W Barton* to supervisor of the Technical Service Department.

Mr Atwood, who has worked on many new applications for VSC's reducing chemicals, succeeds *Hiram B Channon*, who retired in 1959 after 35 years of service with the Company.

Mr Barton has been with VSC since 1949.

•

Appointment of *J Haines Spencer* as vice president and general manager of the USF-Arnold Finishing Division of Indian Head Mills, Inc, has been announced.

Mr Spencer succeeds *William J Durocher*, who has reached retirement age. Mr Durocher will remain with the division on a consultant basis. Mr Spencer will have full responsibility for all manufacturing, marketing and administrative operations of the division.

The USF-Arnold Division is the former USF-Aspinook Finishing Division of Gera Corporation, which was acquired by Indian Head Mills, Inc in March from List Industries Corp. Mr Spencer was vice president of USF-Aspinook.

The USF-Arnold Division is the sixth in the Indian Head Mills organizational structure, which is set up on a decentralized basis with full operating responsibilities centered in the division managers.

One of the largest finishers and printers of textiles in the United States, the USF-Arnold Division is also reportedly the largest finisher in the specialized field of high style fabrics used for draperies and slip covers. It operates plants at Adams, Mass and Hartsville, SC. Sales headquarters are at 261 Fifth Ave, New York.

•

Dan D Downes is no longer associated with Capital City Products Co. He will announce his future plans.

Selden

Joseph W Selden has been named divisional vice president for the Chemical Division, Minnesota Mining Mfg Co, and *Stanley C Prater* has been named advertising manager.

Mr Selden has been general manager of the Chemical Division since April, 1959.

Mr Prater, since 1956, has been associated with the sales program for the Division's fluorochemical products.

•

The board of directors of Seydel-Woolley & Co has announced the election of new officers, effective July 1.

Vasser Woolley, who has served as president of the Company since 1942, will continue to serve as chairman of the board of directors.

Paul Seydel, previously executive vice president, is the new president. He has been in charge of export sales of the Company.

Welling La Grone continues as vice president in charge of Canadian and domestic sales for the Sizing Division.

David Meriwether is the new vice president in charge of Canadian and domestic sales of finishing chemicals. He joined the firm in 1948 to initiate sales of the newly formed Finishing Chemicals Division, and was subsequently made sales manager.

John Seydel continues as secretary and treasurer. He is in charge of the Company finances and of new products development.

Carl Blumenstein, formerly research director, has been named technical director.

D Fae Blackwelder continues as assistant secretary.

•

Raymond M Burke has been appointed supervisor of market research for Heyden Newport Chemical Corp.

Mr Burke has been engaged in research, technical service and related chemical development activities for the past ten years. He joined Heyden Newport in 1959.

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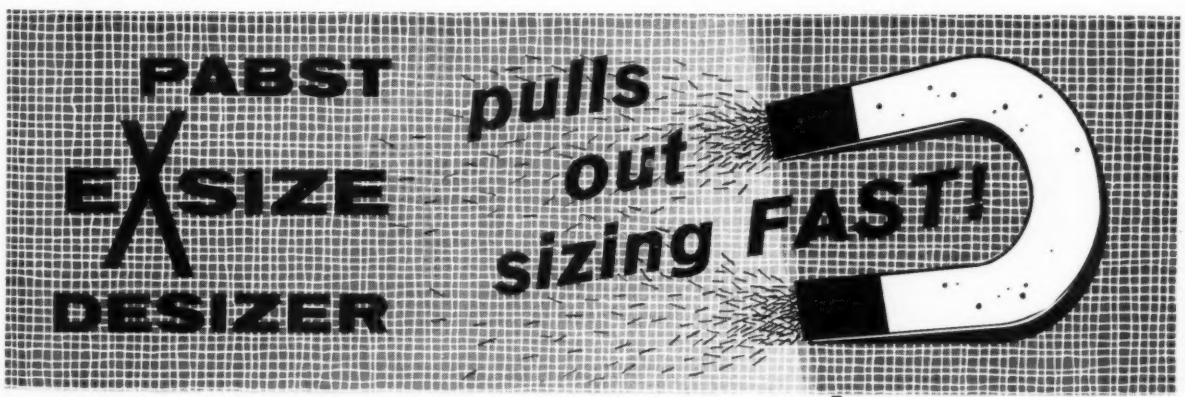

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PABST BREWING COMPANY
Industrial Products Division
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Whalen

Moore

Raynor

James F Whalen Jr has been promoted to Southern district manager for Becco Chemical Division of Food Machinery and Chemical Corp. Mr Whalen, who has been Mid-West district manager, in Chicago, since April, 1956, previously served as a Becco sales representative in the South from January, 1949, until he was transferred to Chicago. He succeeds *D Stewart Quern*, who has been named sales coordinator for all the Inorganic Chemical Divisions of FMC in the Southern territory.

Vernon E Moore, Becco's West Coast manager in Los Angeles for the past three years, succeeds Mr Whalen as Mid-West district manager.

Arthur J Raynor Jr succeeds Mr Moore as West Coast district manager. His new headquarters will be in Vancouver, Wash.

Douglas N Threader succeeds Mr Raynor as a Becco sales representative in the Ohio-Indiana territory with headquarters in Cincinnati.

●

Hanes Hosiery Mills Co has appointed *Harvey N Young* superintendent of finishing at the Winston Division, and *D E Anderson* superintendent of finishing at the new Weeks division.

Mr Young was formerly superintendent of the boarding and dyeing processes. Mr Anderson was foreman of the looping department.

●

David Rogoff has joined the Associated Merchandising Corp as assistant to *Louis J Villa*, director of the Bureau of Standards and Specifications.

Mr Rogoff goes to AMC from Arkwright, Inc, where he operated the testing laboratory for US Testing Co.

Two hundred representatives of 64 member companies of the Synthetic Organic Chemical Manufacturers Association gathered May 11-13 at Shawnee Inn, Shawnee-on-Delaware, Pa, for the annual Spring outing.

Geared primarily to providing an opportunity for an informal get-together of members of the organic chemical industry, the outing nevertheless featured a business meeting at which SOCMA committee chairmen reported on the activities and accomplishments of their committees and the immediate legislative problems which they face in Washington.

Recreation was provided in the form of a golf tournament with the winners being: *A J A Bryan*, Monsanto Chemical Co; *Jack L Crist Jr*, Southern Dyestuff Co; *W A Bours III*, E I duPont de Nemours & Co, Inc; *Roy R Hamilton*, Harshaw Chemical Co; *R C Brown*, E I duPont de Nemours & Co, Inc; *J E Spencer*, Harshaw Chemical Co; *Myron T Foveaux*, Monsanto Chemical Co; *C E Griffith*, Fries Bros Inc; *J L Foy*, Publicker Industries Inc; *E M Loeser*, Fries Bros Inc; *R L Bateman*, Union Carbide Corp; *J E Shand*, Allied Chemical Corp; *C P Berdell*, Allied Chemical Corp; *G H Fremon*, Union Carbide Corp; *R H MacEachen*, The Dow Chemical Co; *W J Weed*, Berkeley Chemical Corp; *G I Esselen*, Pittsburgh Chemical Co; *P R Rector*, Union Carbide Corp; *E S Robson*, Monsanto Chemical Co; *J C Esher*, Allied Chemical Corp; *W M Anderson*, Union Carbide Corp; *F L Byrom*, Koppers Co, Inc; *N B Conley*, American Cyanamid Co; *G C Fordyce*, American Cyanamid Co; *B W Jones*, Pitt-Consol Chemical Co; *J Pursglove, Jr*, Pitt-Consol Chemical Co; *W G Schneider*, Ultra Chemical Works, Inc; *B S Taylor*, Food Machinery & Chemical Corp; *R M Young*, Ultra Chemical Works, Inc.

●

Retirement of three faculty members at Lowell Technological Institute has been announced.

Lester H Cushing, athletic director and head of the department of physical education at the time of his retirement, devoted 49 years of service to the institute. He has served as head of the department of languages and humanities and as chairman of the faculty, in the latter position for two separate terms.

Wentworth Williams, formerly dean of students, and since 1953 a full professor in the department of languages and literature, retires after 10 years.

James A Irvine, an instructor in textile engineering, completed five years at LTI.

Wilbur

Prytherch

Berger

Earl R Wilbur has been transferred from the New England branch to the New York-Philadelphia branch of the Dyestuff and Chemical Div, General Aniline & Film Corp. Mr Wilbur's responsibilities include sales of dyes and chemicals to the textile trade in the northern New Jersey area.

Mr Wilbur will now sevice the accounts formerly covered by *Kenneth M Prytherch*, who was promoted to the company's Azo-Condensation Department and assigned the duties of product engineer in New York. In his new position, Mr Prytherch will provide liaison between field sales and manufacturing and research activities. The Azo-Condensation Department is concerned with acid, basic, chrome, direct and disperse dyes as used by the textile, leather and paper industries.

Richard Berger has been promoted to the position of supervisor—market research of the Dyestuff and Chemical Division. Since 1952, when he was transferred to General Dyestuff Co (a sales division), he has worked in the area of market research.

●

G H Dunlap, director of the Placement Bureau and chairman of the Scholarship Committee in North Carolina State College's School of Textiles since 1943, was presented the "Man of the Year" award by the NC State College Chapter of Phi Psi, national honorary textile fraternity, at Raleigh, NC last month.

Presentation of the award to Dunlap was made at a banquet at the Charcoal Steak House. Dean of the School of Textiles, *Malcolm E Campbell*, made the presentation.

The award has been presented annually since 1946.

Metcalf

George T Metcalf received the Silver Medal Award as Ad Man of the Year from the Advertising Club of the Providence Chamber of Commerce at its Annual Dinner on May 12, 1960. Mr Metcalf was cited for "distinguished service in the field of advertising over the span of almost half a century, a continuous devotion to the principles and practice of our profession interrupted only by his military tour of duty during the First World War."

As Chairman of the Board, Mr Metcalf takes a vigorous part in the business of George T Metcalf Co, Providence public relations and advertising agency, which he founded in 1932.

•

Special Awards to thirteen employees for their outstanding achievements in General Aniline & Film Corp during 1959 were announced recently by Philip M Dinkins, president. The monetary awards, which totaled $11,500, were made in accordance with the Company's Executive Incentive Compensation Plan program and were presented at the work locations of the winners.

Of the thirteen awards, twelve employees of the Company's Dyestuff & Chemical Division were winners.

The highest monetary award was a group award won by *A F Strobel*, chemist leader, and *S C Catino*, development chemist II, both of the Rensselaer plant Process Research and Development Department, for outstanding research and development work in the field of brightening agents.

Second place in monetary awards went to *L C Wilbur*, manager of the Paper Emulsion Department of the Ansco Division at Binghamton, NY, for his contribution in reducing cost of manufacturing photographic paper, and also to *L Ginsburg*, supervisor, analytical development at the Linden Plant of the Dyestuff & Chemical Division, for his solution of complex analytical problems leading to increased sales.

The third highest award was won by *J R Smith*, production scheduler of the Production Department of the Rensselaer plant, for process changes resulting in increased brightener production.

The other Special Award winners, all in the Dyestuff & Chemical Division, were as follows:

F J Basile, office manager, New York sales, division headquarters, for improvement in order handling procedures; Rensselaer plant—*H Schilling*, power plant engineer, Engineering Department, for significant and continuing reduction of energy costs; *C Streck*, senior development colorist, Control Department, for improvement in quality and reduction in process costs in the manufacture of dyes; *P P Zirgules*, supervisor of technicians, Control Department, for development of new and novel spectrophotometric procedures in dyestuff analysis; Linden plant—*Arnold G Schwartz*, staff engineer, Engineering Department, for recommendations leading to a significant reduction of cost pertaining to chloralkali production; *Arthur Schwartz*, control chemist, Process Research and Development Department, for development of improved analytical methods in acetylene chemicals; and *E G Yee*, chemical engineer I, Process Engineering Department, for outstanding process engineering contributions related to production of a volume specialty chemical; Central Research Laboratories—*H R Mautner*, research chemist I, Research Department, for his ingenuity in the development of special dyeing assistants and in finding unusual textile applications for acetylene chemicals.

•

George H Hotte, director of Allied Chemical's Fiber Marketing Department, was the recipient, June 4, of an honorary Doctor of Textile Science Degree, awarded by the New Bedford Institute of Technology, New Bedford, Mass.

•

Nopco Chemical Co, Newark, NJ, has announced the selection of *Barbara Louise Grant* as winner of the Charles P Gulick Scholarship for 1960. Miss Grant is the daugther of *David M Grant*, maintenance foreman at the Carlstadt, NJ, plant of Jacques Wolf & Co, a Nopco subsidiary. Mr Grant has been with Jacques Wolf twenty-five years.

Established in 1956, the Gulick Scholarship is a tribute to the memory of Nopco's founder, Charles P Gulick, who died in 1955, and to his interest in the education of America's youth.

Awarded annaully to the son or daughter of a Nopco employee, the Scholarship provides the winner $750.00 per year for four years at any accredited college of his choice. The winner is selected on the basis of scholastic achievement, character, all-round personality, and financial need.

Presentation of the award was made by *Harry A Batley*, executive vice president of Nopco and president of Jacques Wolf Co. *Gerald J Desmond*, vice president of Jacques Wolf, also officiated.

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CLASSIFIED ADVERTISEMENTS

Advertisements in this section are restricted to HELP WANTED — POSITION WANTED — EQUIPMENT wanted or for sale. Rates, effective February 1, 1951: One-time, $14.00 per column inch; 13 or more times, $12.00 per column inch: Position Wanted, $4.00 per column inch. Figure 38 average words per column inch. Publisher reserves the right to reject or discontinue any classified advertisement. Replies should be addressed: Box Number ..... c/o American Dyestuff Reporter, 41 East 23rd Street, New York 10, N. Y.

• *SERVICES* •

ABSTRACTING SERVICES—Abstracting and digesting of foreign patents and periodicals. Literature review and special reports in dyestuffs and cellulose chemistry. PAUL WENGRAF, 88-36 ELMHURST AVENUE, ELMHURST 73, NEW YORK.

TEXTILE CHEMISTRY—Experienced, solicits problems in textile chemistry to be worked out in private laboratory. Development of new processes and products a specialty. Write Box No. 874

• *OPPORTUNITIES AVAILABLE* •

WANTED: DYESTUFF OR PIGMENT CHEMIST. Young man with a few years of general lab experience. Good salary and excellent opportunity. Our staff knows about this ad. Write Box No. 932

WANTED: TEXTILE ENGINEER—for specialized textile operations involving synthetic fibers, sizes, dyes, etc. Practical experience necessary, especially in the field of non-wovens. Educational back-ground should include chemistry and physics. Large Cleveland, Ohio concern offers splendid opportunity for advancement. Send complete resume to Box No. 915

WANTED: EXPERIENCED SALESMAN — Industrial chemicals. Chemical background preferred. WORTH CHEMICAL CORPORATION, Greensboro, North Carolina.

WANTED: TEXTILE CHEMIST—Textile Chemist, or Technologist, with knowledge of textile, fabrics, dyes and finishes. Experience in formulation, application and decoration of textile coatings desirable but not necessary. 5 years experience. Male or female. B.S. Degree or equivalent in experience in above field. Salary commensurate with experience. Address all replies to: Box No. 919

WANTED: INK FORMULATOR — EXPERIENCED COLOR FORMULATOR familiar with all aspects of printing inks as required by a high quality commercial printing plant. Expert knowledge in exact color matching and toning of Litho and Letterpress Inks. Modern air conditioned laboratory on the East Coast. Salary open to negotiations and commensurate with experience. Please address all replies to: Box No. 920

WANTED: COLORIST for screen printing plant in New England. Excellent position for the right man. Apply stating experience and references to: NEW LONDON TEXTILE PRINT WORKS, INC., P. O. Drawer 870, New London, Conn. Attention: Mr. Gus A. Harris.

WANTED: SALESMAN FOR CAROLINAS—by old established dyestuff manufacturer. Prefer one with actual piece goods dyeing experience. Our employees know of this advertisement. Give complete background of training and experience in letter to: Box No. 925

WANTED: TEXTILE CHEMIST AND COLORIST—for branch laboratory of one of foremost dyestuff manufacturers. This position offers an excellent opportunity to a capable man. Write Box No. 930

• *PERSONNEL AVAILABLE* •

POSITION WANTED: TEXTILE CHEMIST, Dipl. Ing., Dr. rer. nat., 37. All-round experience in practical dyehouse operations, particularly in dyeing with leucoesters of vat dyestuffs, direct, vat and disperse dyestuffs. Broad experience in standardization, practical application, application research and development of vat and disperse dyestuffs with one of foremost dyestuff manufacturers. Excellent references. Interested in challenging and responsible position. Write Box No. 926

POSITION WANTED: DYEING AND FINISHING SUPERINTENDENT. Thoroughly experienced in dyeing and finishing of all synthetic fibers and their blends. Chemical Background. Excellent executive. Present contract expires in July and will be available at that time. Write Box No. 931

Woodman

Herbert B Woodman, president of Interchemical Corp, has been re-elected for a second one-year term as president of The Economic Club of New York, an organization which provides one of the nation's most prominent platforms for leaders of international and national affairs.

Among those directors of The Economic Club elected at the same time were *J W Keener*, president, The B F Goodrich Co, and *J Spencer Love*, president, Burlington Industries.

•

Herbert C Brown, professor of chemistry at Purdue Univ, Lafayette, Ind, became the first recipient of the newly created SOCMA Gold Medal Award for Creative Research in Organic Chemisty on Tuesday, June 14, at New York City's Hotel Roosevelt, when he was guest of honor at a special luncheon of the Synthetic Organic Chemical Manufacturers Association, sponsor of the citation. *Samuel G Baker*, president of the association, made the presentation.

The medal was awarded to Dr Brown for his overall research work in organic chemistry.

•

Appointment of *Lorand von Kurtos* as general manager of Beckman Instruments, Inc, GmbH, Munich, Germany, a subsidiary of Beckman Instruments, Inc, has been announced.

Dr von Kurtos formerly was associated with Leybold High Vacuum, GmbH, in Cologne.

Beckman employs more than 400 persons in the manufacture of scientific and industrial instrumentation at its Munich plant. The 66,000-square foot facility was the first established in post-World War II Munich by an American firm.

•

Alfred Flaxington has been appointed plant superintendent of Coats & Clark's Pawtucket, RI, mill.

Mr Flaxington joined Coats & Clark in 1918. He progressed through the various lines of supervision, and in 1952 was appointed superintendent of twisting.

In his new capacity, Mr Flaxington will supervise directly all departments in the mill.

Roberts

Promotion of *Robert J Roberts* to district manager of the Fatty Acid Sales Department of Emery Industries, Inc, has been announced.

Mr Roberts will provide field direction for sale of the department's products in the area covered by the New York and Boston offices. This includes New England, Eastern New York State, and New Jersey.

He was assigned to the New York office in 1948, which has been his headquarters ever since. When Emery's sales staff was separated into two departments in 1956, Mr Roberts joined the Fatty Acid sales department.

•

Appointment of *K Russell Knoblauch* as market sales manager for its Philadelphia-based Industrial Products Group has been announced by Minneapolis-Honeywell Regulator Company.

Knoblauch, a veteran of 36 years' service in the Honeywell sales organization, will have supervisory responsibility over managers for nearly a dozen markets in which sales of industrial products are aligned. His most recent assignment was that of chemical industry market manager.

The Industrial Products Group consists of the Brown Instruments and Rubicon Divisions in Philadelphia; Valve Division, Fort Washington, Pa; Industrial Systems Division, Beltsville, Md; Heiland Division, Denver, and Fall River, Mass, Division.

•

George H Collingwood and *Robert C Parker* have been awarded Erwin Mills Co Scholarships in the School of Textiles, North Carolina State College, for the 1960-1 academic year. They are the first winners of the Scholarships, which were established at State College this Spring, each valued at $500. Both will enter N C State in September.

Five North Carolina high school students have been awarded Dickson Foundation, Inc, Scholarships valued at $750 each. They are *Hoyt G Lowder, Walter E Long, Bobby G Harris, Raymond L Shelton, and Edgar W Lefler III*.

Leboeuf

Harold W LeBoeuf has been named manager of manufacturing of General Electric's Silicone Products Department. He succeeds *James R Donnalley*, who recently assumed the post of general manager of the Company's Insulating Materials Department in Schenectady, NY.

Mr LeBoeuf, who first became associated with General Electric in 1937, was formerly manager of the intermediate operation.

•

The Borden Chemical Co, a division of The Borden Co, has announced the appointment of *Gilbert L Hembre* and *Edward F Wezowicz* as technical sales representative for the Polyco-Monomer Department. Mr Hembree will be responsible for the sales of Polyco-Monomer's full line of synthetic resins in Wisconsin, Minnesota, and upper Michigan, operating from the Company's midwest office in Elmhurst, Ill; while Mr Wezowicz will operate in the same capacity in the New York City area. Mr Hembree was previously associated with Allied Chemical Corp as a sales representative. Mr Wesowicz was previously with Du Pont as a chemist for technical sales.

Thomas L Trafford has been named engineering manager for Borden's Resins & Chemicals Department, for which he will be responsible for all phases of the engineering requirements at the Bainbridge, NY, Browntown, Wis, Demopolis, Ala, and Fayetteville, NC plants. He will headquarter at the Bainbridge plant.

In Coatings and Adhesives Department, *James H Christopher Jr* has been named sales manager; *Seymour Kirsch*, development manager; and *Robert E Munsell*, North East regional sales manager.

Mr Christopher, with Borden's since 1954, will be responsible for sales of the department's line east of the Rocky Mountains. He and Mr Munsell will headquarter at the Company's Peabody, Mass office.

Mr Kirsch, who formerly headed the Organic Disperisions Section of the Peabody Development Laboratory, will be in charge of research and development.

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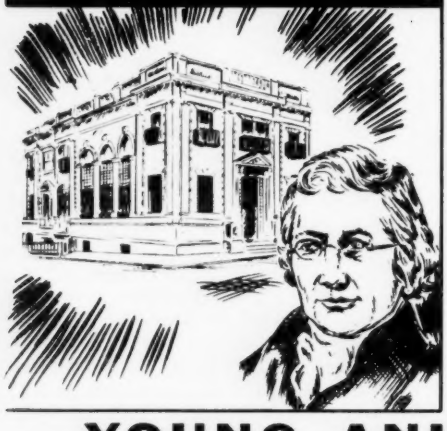

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